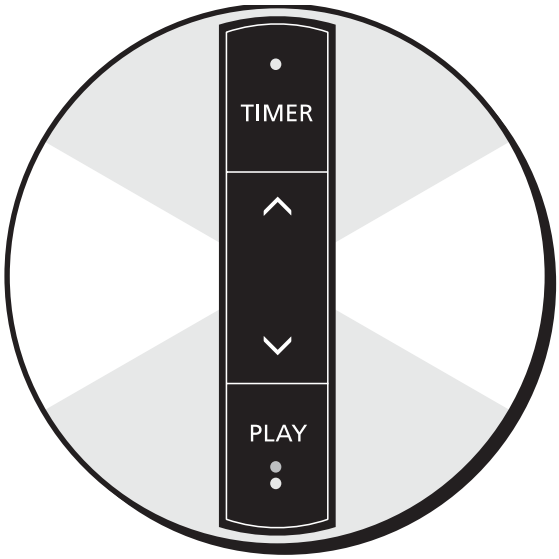
BEOLINK

Master **L**ink Handbook



BANG & OLUFSEN

FOREWORD

This manual describes the Bang & Olufsen BeoLink® system (Master Link) with particular reference to the installation requirements. The manual is therefore of special interest to dealers and installers.

The installation of all products, whether stereo equipment, PC's, natural gas equipment etc., used in systems (networks), makes it necessary to meet certain connection requirements. These requirements serve to ensure the best possible use of the system once connected.

This also applies to the Bang & Olufsen BeoLink system. There are not too many of these system requirements, but it is important that you are familiar with them, as meeting the basic requirements is often what ultimately determines whether the system works correctly once the installation has been completed.

The manual provides a short and precise introduction to the basic rules that need to be observed when installing BeoLink, and describes how you achieve compatibility between Master Link products and Master Control Link products.

The manual is to some extent structured as a reference work, but it it should be read in its **entirety** to give you a complete overview. Only then will it be suitable for use as a reference work.

January 2004

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READING GUIDE

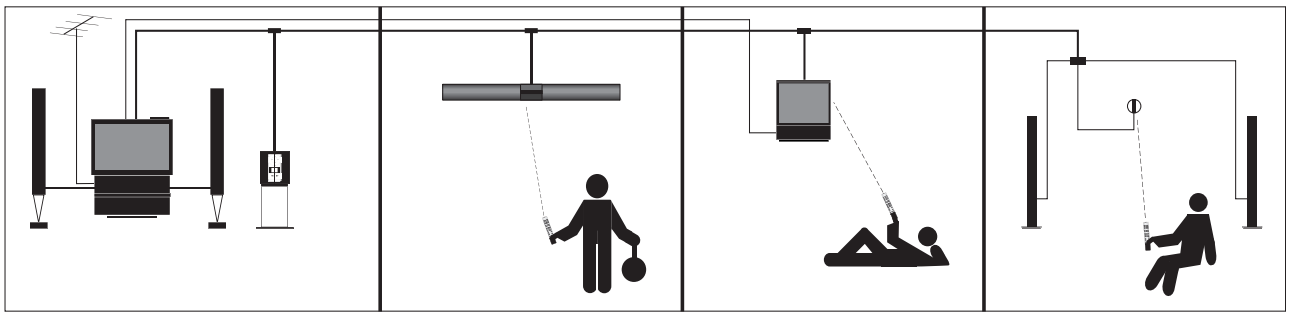
Different symbols are used in the manual to illustrate the audio products, video products and loudspeakers. Unless otherwise mentioned in the text, these symbols should only be taken to refer to one of the above-mentioned product categories, and not to the specific product depicted in the illustration.

As the manual places special emphasis on the basic rules for installation of the BeoLink system, we mention the common features of the products and insofar as possible avoid mentioning any differences in detail there may be. The manual will therefore always be relevant to the installation of Master Link, whether the products were launched before or after the manual came out. The basic rules for Master Link will always be the same.

If you require product-specific information, please refer to Bang & Olufsen's Product Configuration Guide.

OVERALL DESCRIPTION

What is BeoLink?



BeoLink is a Bang & Olufsen concept. It covers the following:

1. The ability to create and operate audio/video systems
2. The ability to distribute sound and pictures from a Bang & Olufsen system in a main room to other rooms in the home and to operate the main room system from the rooms that are connected using BeoLink.

BeoLink is not a product – it is a number of qualities that arise as a result of the intelligent interaction between products, a synergistic effect.

BeoLink can be constructed in various ways depending on the products being used: basically either using the Master Link system or the Datalink/ Master Control Link (MCL) system (the older system).

An introduction to Master Link

As a connection method, Master Link has certain benefits over the MCL system.

One such example is that while the connection in the main room previously had to be made using a specific type of cable (7-pin Datalink – also known as Audio Aux Link) and the connection between the main and link room with another type of cable (Master Control Link), the Master Link system uses a bus-type connection which handles all links, i.e. both between the main room's audio/video systems and between the main and link rooms.

A further benefit is totally independent volume adjustment and tone control in all link rooms which is provided by the distribution of audio signals at line level and the use of a power amplifier in each individual link room.

Unlike the previous signal distribution system, Master Link signals are distributed as balanced signals, making it possible to distribute CD quality sound, even over relatively long cable distances.

Finally the accessories used for distribution have been improved by the introduction of a thinner cable and new cable termination methods, among other things. The main benefit of these improvements is that installation has become simpler and more elegant. This applies in particular to small installations, e.g. of an intelligent kitchen loudspeaker, which is now simple and effective, while larger installations still require a fair amount of planning and knowledge of installation methods – a fact illustrated by the very existence of this manual.

BeoLink has the ability to distribute both audio and video signals. In the Master Link system audio and control signals are distributed using a single cable, while the distribution of video signals requires an aerial network (coax).

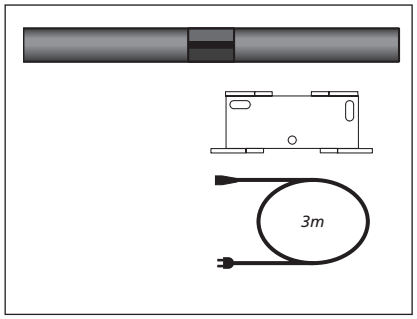
Only BeoLink-compatible products can be fully integrated into a BeoLink system, whereas products from earlier seasons can to a limited extent be used as described in the section on compatibility setups, page 17.

PRODUCT DESCRIPTION

Below you can find descriptions of the Master Link products and accessories supplied with them, together with details of how they are used.

Contents

BeoLab 3500



BeoLab 3500 is an integrated active link room loudspeaker with right and left sound channels. BeoLab 3500 has a Master Link (ML) connection, IR receiver and display. BeoLab 3500 also has a Master Control Link (MCL) connection. Finally there is a built-in time display in BeoLab 3500.

BeoLab 3500 is supplied with a mains cable and fittings for wall mounting.

Use

BeoLab 3500 is used in link rooms where an integrated active loudspeaker is to be used. BeoLab 3500 enables you to listen to and operate all sources in the main room, both audio and video sources.

BeoLab 3500 has a built-in sound control circuit, allowing volume and sound adjustment to be performed individually in relation to the main room.

The sound adjustment facilitates individual adjustment of balance, bass, treble and loudness.

BeoLab 3500 has the following local control options:

- Timer on/off
- PLAY / ST.BY

Type number

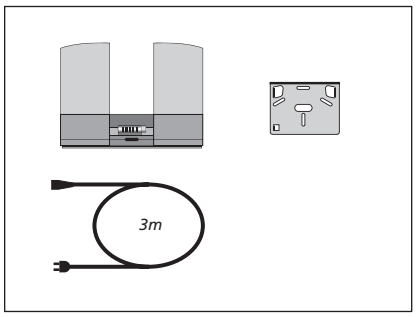
1160111 (EU)
1160211 (GB)
1160311 (USA/CDN)
1160411 (JAP)
1160511 (AUS)
1160711 (KOR)
1160811 (CHN/HK)

Miscellaneous

In addition to the accessories supplied, the installation may require a Master Link cable and plugs, sockets and junction boxes (see also section on installation types, page 23).

1160611 Table stand for positioning on shelf/table (flat surface).

Contents



BeoLab 2000

BeoLab 2000 is an integrated link room loudspeaker that consists of an active loudspeaker with a Master Link (ML) connection, an IR receiver and a local control panel.

BeoLab 2000 is supplied with a mains cable with fittings for wall mounting.

Use

BeoLab 2000 is used in link rooms where an integrated active loudspeaker is required. BeoLab 2000 allows you to listen to all sources from the main room, both audio and video sources.

BeoLab 2000 has built-in volume adjustment which allows the volume to be adjusted independently of the main room.

BeoLab 2000 has the following local control options:

- Timer on/off
- PLAY / ST.BY
- Volume up/down:
- Local selection of Radio, CD and TV
- Step button for changing channel or track

Type number

1164126 (EU)
1164226 (GB)
1164326 (USA/CDN)
1164426 (JAP)
1164526 (AUS)
1164626 (KOR)
1168026 (CHN/HK)

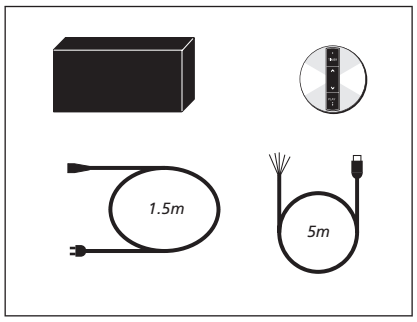
Miscellaneous

In addition to the accessories supplied with BeoLab 2000, the installation also requires a Master Link cable and socket, plug sockets and junction boxes (see section on installation types, page 23).

1206626 Corner mounts (for installation in corners).

Contents

BeoLink Active



BeoLink Active consists of a control box, an IR receiver, a cable to the IR receiver and a mains cable.

Use

BeoLink Active is used in link rooms together with active loudspeakers. Any type of Bang & Olufsen active loudspeaker can be connected. If you connect a BeoLab 8000, you will also need a Y link, as BeoLink Active only has one Power Link signal, and the signal cannot be looped further into the BeoLab 8000.

BeoLink Active has a built-in sound control circuit, allowing volume and sound adjustment to be performed individually in relation to the main room.

The sound adjustment facilitates individual adjustment of balance, bass, treble and loudness.

BeoLink Active enables you to listen to the sound from all products in the main room – both video and audio sources.

BeoLab Active provides the following local control options:

- Timer on/off
- PLAY / ST.BY
- Volume adjustment

Type number

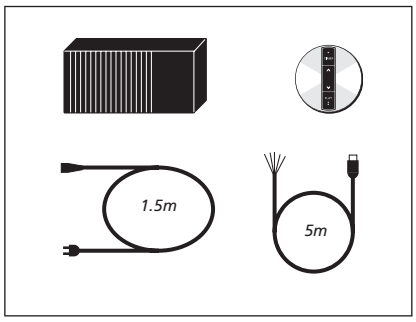
1163666 (EU)
1163766 (KOR)
1163866 (USA/CDN)
1163966 (JPN)
1168166 (CHN/HK)

Miscellaneous

In addition to the accessories supplied, the installation also requires a Master Link cable and plugs, sockets and junction boxes (see also section on installation types, page 23).

Contents

BeoLink Passive



BeoLink Passive consists of a control box, an IR receiver, a cable to the IR receiver and a mains cable.

Please note the following for installation: the amplifier block is designed to function within a temperature range of 10-40° C. At temperatures outside this range it can block the whole Master Link system if connected to one.

Use

BeoLink Passive is used in link rooms together with passive loudspeakers. All Bang & Olufsen passive loudspeakers can be connected.

BeoLink Passive has built-in sound control, which means that sound and volume can be adjusted independently of the main room.

Using the volume adjustment it is possible to adjust balance, bass, treble and volume individually.

BeoLink Passive enables you to listen to the sound from all the main room's products – both video and audio sources.

BeoLink Passive has the following local control options:

- Timer on/off
- PLAY / ST.BY
- Volume up/down:

Type number

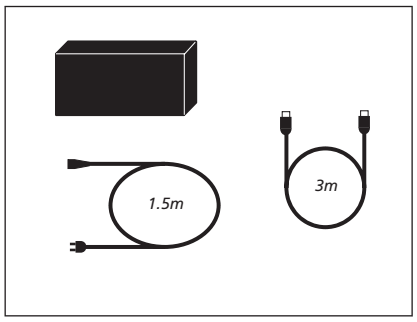
1165566 (AUS)
1165666 (EU)
1165766 (GB)
1165866 (USA/CDN)
1165966 (KOR)
1166766 (CHN/HK)

Miscellaneous

In addition to the accessories supplied with BeoLink Passive, the installation also requires a Master Link cable and plugs, sockets and junction boxes (see section on installation types, page 23).

Contents

BeoLink Video



BeoLink Video consists of a control box, a mains cable and a Datalink cable.

Installation also requires a coax cable connected to the HF socket of the Video system in the main room. The other end of the coax cable connects to the aerial socket of the link room TV.

Use

BeoLink Video is used in rooms where both sound and picture are to be reproduced on an older Bang & Olufsen TV without a Master Link socket. BeoLink Video connects to the link room's TV via the Datalink cable supplied.

BeoLink Video gives you access to all sources in the main room equipment. It should be especially emphasized that it is possible to operate and watch SAT programmes and video tapes, and in such cases it is also possible to watch and operate decoded programs from TV and SAT receivers in the main room. You can also access all audio sources reproduced through the loudspeakers in the Bang & Olufsen link room TV. If you wish to have a broader stereo perspective and higher volume, active loudspeakers can be connected to the link room TV.

BeoLink Video connects to the TV via the attached 7-pin Datalink-cable and to the main room system via a Master Link cable. In addition there is a coax cable (see page 24).

Type number

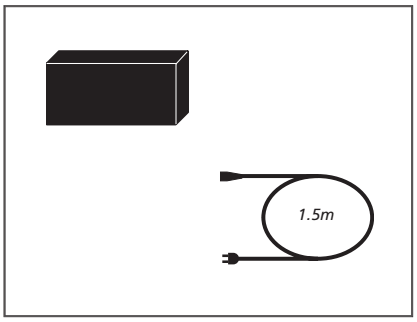
1161566

Miscellaneous

In addition to the accessories supplied, the installation also requires a Master Link cable, a coax cable, plugs, sockets and junction boxes (see also section on installation types, page 23).

Contents

BeoLink Converter



BeoLink Converter consists of a control box and a mains cable.

Use

BeoLink Converter is used to connect an audio and a video system where one system is based on Master Link and the other on Datalink (Audio Aux Link).

BeoLink Converter can be used both with an audiomaster and a videomaster. BeoLink Converter has autoconfiguration, which means that it can automatically decide if it is in a Master Link video system or in a Master Link audio system. Configuration takes place after mains connection.

BeoLink Converter can also be used as an ML driver*, which means that it is possible to connect e.g. a BeoCenter 2300 via the BeoLink Converter to the Master Link and thereby distribute the sound to all link room products (see page 17).

BeoLink Converters are used in compatibility setups (see section on recommended compatibility setups, page 17).

Type number

1160966 (KOR)
1161166 (EU)
1161266 (USA/CDN)
1161466 (old version)

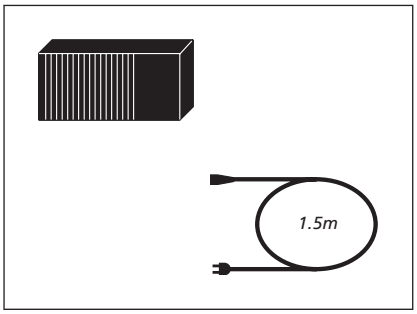
Miscellaneous

In addition to the accessories supplied, the installation also requires a Master Link cable and plugs, sockets and junction boxes (see also section on installation types, page 23).

* NOTE!
BeoLink Converter, type no. 1161466 cannot be used as an ML driver.

Contents

ML/MCL Converter



ML/MCL Converters consist of a control box and a power amplifier.

Use

ML/MCL Converters are used when it is necessary to convert from Master Link (ML) to Master Control Link (MCL). A conversion is necessary where an existing MCL installation is to be used together with a Master Link driver in the main room, e.g. a BeoSound Ouverture.

ML/MCL Converters can also be used if the main room system consists of a BeoSystem AV 9000 and a Master Panel AV 9000 with distribution via an existing MCL system.

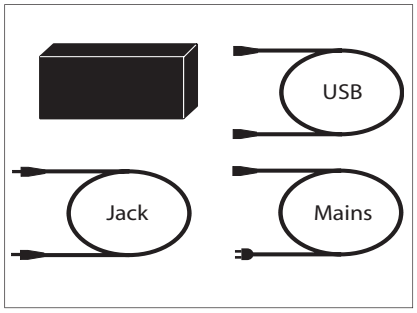
See section on setups using ML/MCL Converters, page 19.

Type number

1165066 (AUS)
1165166 (EU)
1165266 (GB)
1165366 (USA/CDN)

Contents

BeoLink PC2



BeoLink PC2 consists of a control box which is connected to the computer via a USB and jack plug cable. All connections are made to this box (Mains, Master Link, Power Link and any IR eye).
If you want to watch TV and DVD on the computer via BeoLink, a TV card must also be installed in the computer (the card can be purchased as an accessory) and a coax cable from the video system's HF socket in the main room.

Use

BeoLink PC2 allows you to listen to your saved music files in the rest of your Master Link system (e.g. in the main room). It is also possible to listen to sources while sitting at your computer (e.g. radio and CD).
It is possible to connect an IR eye (8087030) and Power Link loudspeakers.

Type number

1670 (EU)
1671 (DK)
1672 (GB)
1673 (USA/CDN)
1674 (JPN)
1675 (AUS)
1678 (CH)
1679 (I)

Miscellaneous

In addition to the accessories supplied, the installation also requires a Master Link cable and plugs, sockets and junction boxes (see also section on installation types, page 23).

SETUPS

Recommended setups

A mechanism constructed using several components can generally only be put together in one way, if the intended result is to be achieved. For example, a gear box in a car will not work at its best if you do not fit all the necessary gear wheels. If you manage to fit one gear wheel too many this is likely to cause problems.

The point of the above is that you can only make things work properly by putting them together in the way they were designed.

This also applies to the Bang & Olufsen BeoLink system. In theory Bang & Olufsen products can be combined in many different ways. As it would be totally impossible to gain an overview of even a fraction of the many combination possibilities, Bang & Olufsen has selected the most attractive setups. These selected combinations are referred to as recommended setups. The recommended setups are the focus of product development and service.

When planning a BeoLink system, it is therefore very important to adhere to the recommended setups.

If the recommended setups are not followed, you could easily risk finding yourself in the same situation as that mentioned above, i.e having a gear box with one gear wheel too many or too few.

In addition, Bang & Olufsen ONLY services the recommended setups.

Option programming

One of the conditions required for the setups to function optimally is that the products included in the setup "know" the type of system they form part of.

The actual option programming is performed by entering a particular key sequence on the remote control.

When you use Beo4, the programming sequences are as follows:

● Press and hold down the button

then

LIST Press to access the setup function. The display on Beo4 shows [OPTION?] – release both buttons

GO Press to accept that you wish to perform option programming

LIST Press to change the text on the display to
[V.OPT] for BeoVision, or
[A.OPT] for Beomaster/BeoSound, or
[L.OPT] for link room products

then

1 Press the correct number for the selected option, e.g. 1.

When you use BeoLink 1000, the programming sequences are as follows:

BeoVision: ● PICTURE "number" STORE

Beomaster/BeoSound: ● SOUND "number" STORE

Link room product: ● LINK "number" STORE

The number selection depends on the setup.

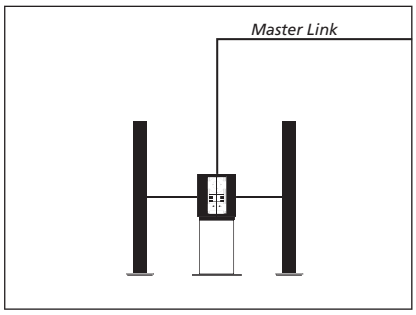
Option 0 = No IR reception
Option 1 = Two IR receivers in the same main room
Option 2 = One IR receiver in the main room
Option 4 = Link room product connected to one or two main room products in the same room
Option 5 = Two IR receivers in the same link room
Option 6 = One IR receiver in the link room

Most of the main room products are delivered with the correct option setting from the factory and are therefore "ready for use". Link room products generally have to be option programmed, depending on the setup they are used in.

It should be noted that in some situations you can find yourself working with products that have been installed previously, e.g. in connection with a conversion of the home. We have therefore provided the correct option in all illustrations, including those that are supplied "ready to use" from the factory.

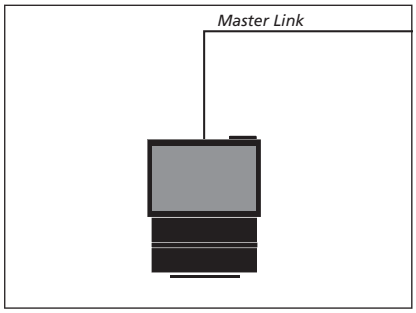
NB:
If the option programming is not performed correctly, there will be errors in operation.

Recommended main room setups



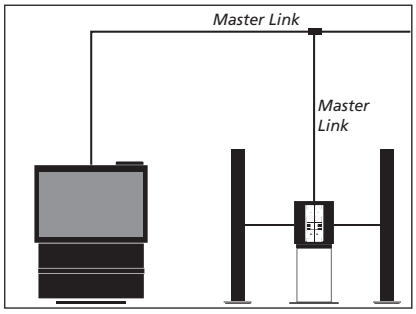
Audio system in one room

BeoSound option programming : Ready for use
BeoSound factory programming : Option 1



Video system in one room

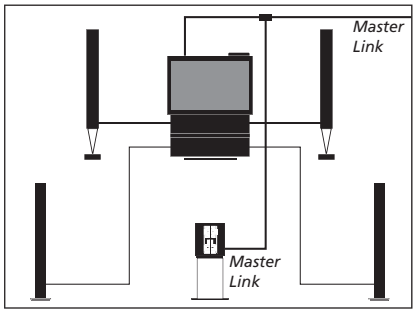
BeoVision option programming : Ready for use
BeoVision factory programming : Option 1



AV system in one room

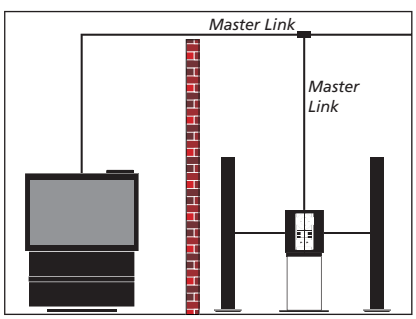
1.
BeoVision option programming : Ready for use
BeoVision factory programming : Option 1

BeoSound option programming : Ready for use
BeoSound factory programming : Option 1



2.
BeoVision option programming : Option 2
BeoVision factory programming : Option 1

BeoSound option programming : Option 0
BeoSound factory programming : Option 1

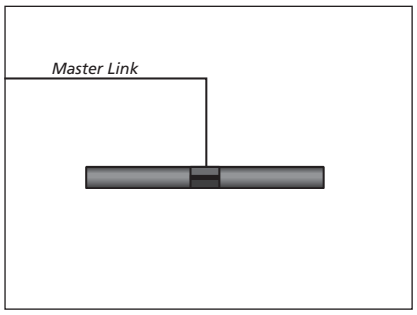


AV system in two rooms

BeoVision option programming : Option 2
BeoVision factory programming : Option 1

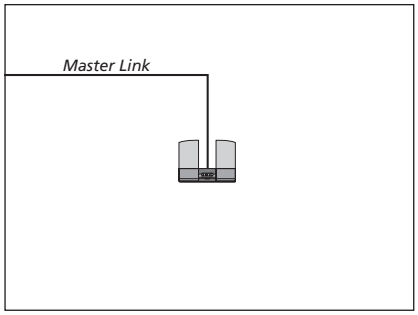
BeoSound option programming : Option 2
BeoSound factory programming : Option 1

Recommended setups for one product in a link room



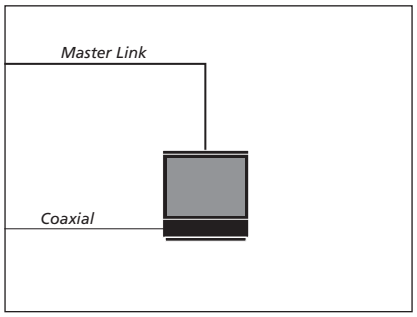
BeoLab 3500

Option programming : Ready for use
Factory programming : Option 6



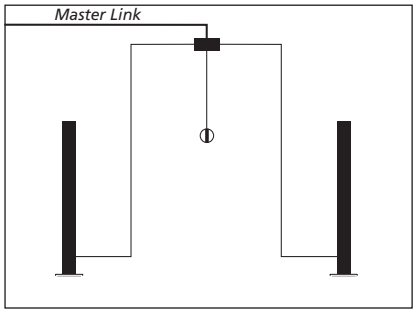
BeoLab 2000

Option programming : Ready for use
Factory programming : Option 6



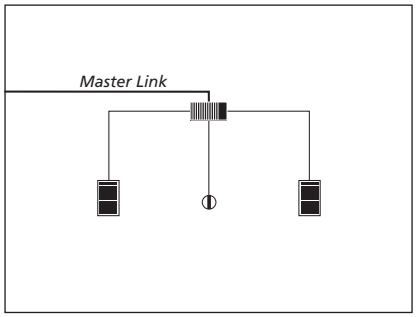
BeoVision MX 4200

Option programming : Option 6
Factory programming : Option 1
Master Link : Accessories



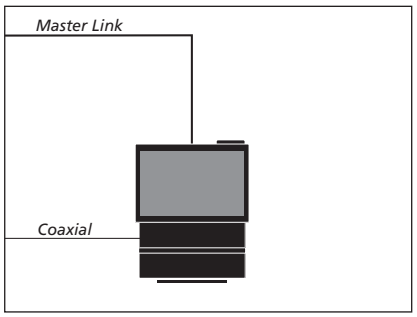
BeoLink Active

Option programming : Ready for use
Factory programming : Option 6



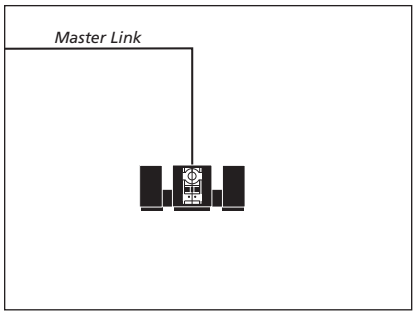
BeoLink Passive

Option programming : Ready for use
Factory programming : Option 6



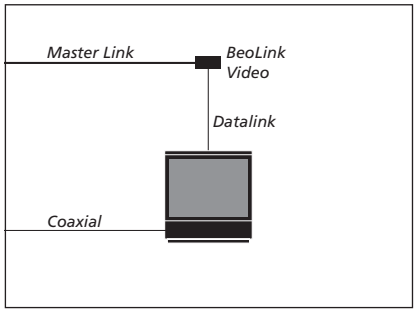
BeoVision Avant

BeoVision option programming : Option 6
BeoVision factory programming : Option 1



BeoSound 3000

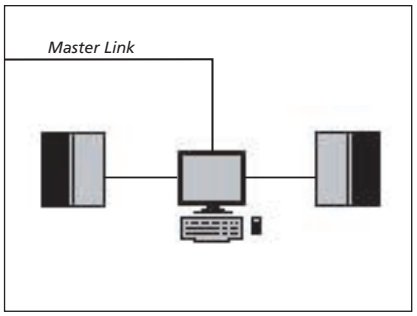
BeoSound option programming : Option 6
BeoSound factory programming : Option 1



BeoLink Video

BeoVision option programming : Option 6
BeoVision factory programming : Option 1

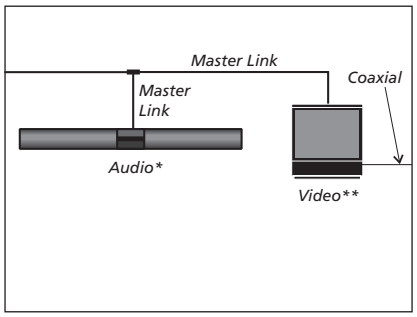
NOTE!
Information on options and programming for a BeoVision connected to BeoLink Video can be found in Bang & Olufsen's Product Configuration Guide.



BeoLink PC2:

BeoLink option programming : Option 6
BeoLink factory programming : Option 6

Recommended setups for one audio and one video product in link rooms



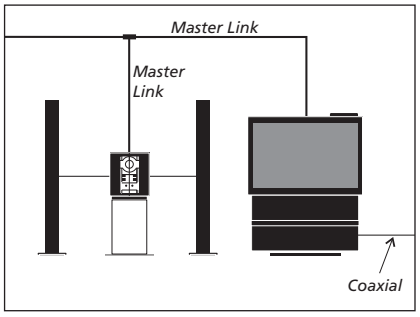
* *NB:*
Applies to all Audio link room products.

** *NB:*
Applies to Video link room products incl. BeoLink Video

1.

BeoLab/BeoLink option programming	:	Option 5
BeoLab/BeoLink factory programming	:	Option 6
BeoVision MX 4200 option programming	:	Option 5
BeoVision MX 4200 factory programming	:	Option 1

NOTE!
Information on options and programming for a BeoVision connected to BeoLink Video can be found in Bang & Olufsen's Product Configuration Guide.



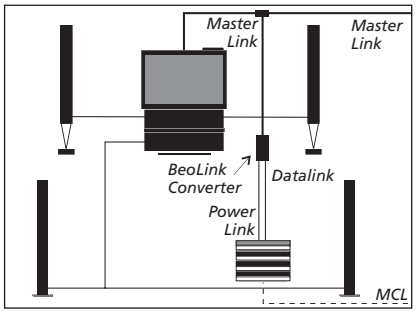
2.

BeoSound option programming	:	Option 5
BeoSound factory programming	:	Option 1
BeoVision Avant option programming	:	Option 5
BeoVision Avant factory programming	:	Option 1

Recommended compatibility setups

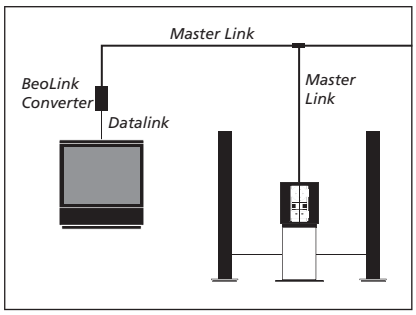
Compatibility between products using Master Link and Datalink (Audio Aux Link) connections or Master Control Link connection.

Setup in one room



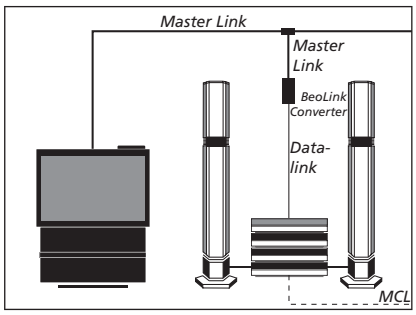
1.
BeoVision option programming : Option 2
BeoVision factory programming : Option 1

Beomaster option programming : Option 0
Beomaster factory programming : Option 1



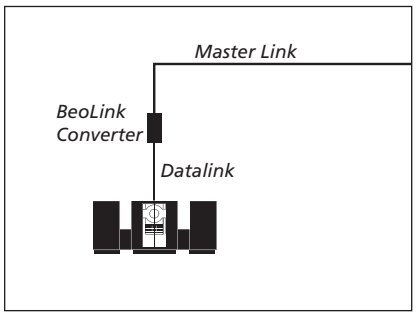
2.
BeoVision option programming : Ready for use
BeoVision factory programming : Option 1

BeoSound option programming : Ready for use
BeoSound factory programming : Option 1

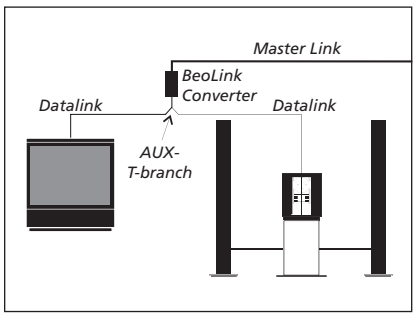


3.
BeoVision option programming : Ready for use
BeoVision factory programming : Option 1

Beomaster option programming : Ready for use
Beomaster factory programming : Option 1



4.
Option programming : Ready for use
Factory programming : Option 1

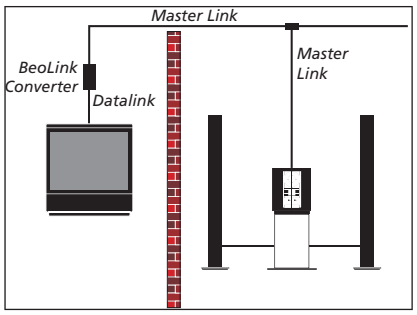


5.
BeoVision option programming : Ready for use
BeoVision factory programming : Option 1

BeoSound option programming : Ready for use
BeoSound factory programming : Option 1

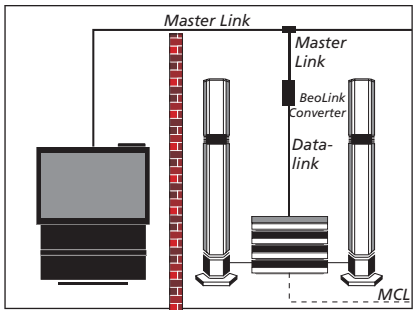
NOTE!
Information on the Beomaster/BeoCenter products and BeoVision TVs that can be used with BeoLink Converter can be found in Bang & Olufsen's Product Configuration Guide.

Setup in two rooms



1.
BeoVision option programming : Option 2
BeoVision factory programming : Option 1

BeoSound option programming : Option 2
BeoSound factory programming : Option 1



2.
BeoVision option programming : Option 2
BeoVision factory programming : Option 1

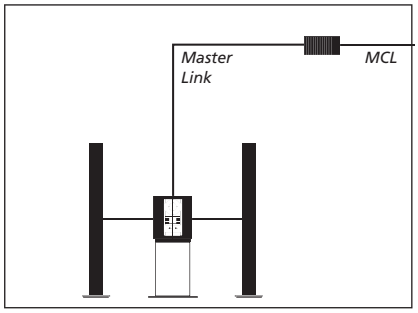
Beomaster option programming : Option 2
Beomaster factory programming : Option 1

NOTE!
Information on the Beomaster and BeoVision products that can be used with the BeoLink Converter can be found in Bang & Olufsen's Product Configuration Guide.

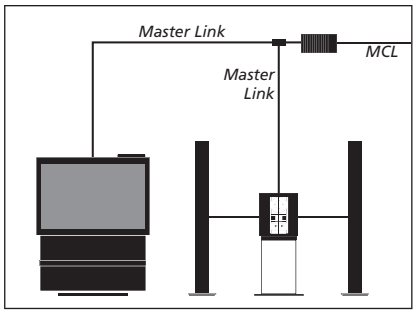
Setups using ML/MCL Converters

ML/MCL Converters are used when an existing MCL system is to be used together with a new ML audio system in the main room.

ML/MCL Converters can be connected to all recommended MCL link room setups, cf. the Master Control Link manual.

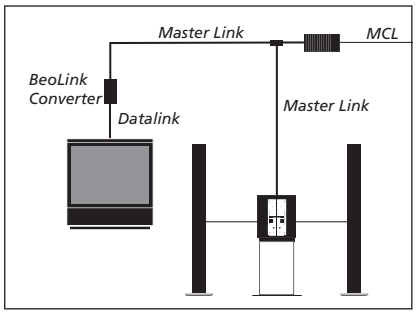


1.
BeoSound option programming : Ready for use
BeoSound factory programming : Option 1



2.
BeoVision option programming : Ready for use
BeoVision factory programming : Option 1

BeoSound option programming : Ready for use
BeoSound factory programming : Option 1



3.
BeoVision option programming : Ready for use
BeoVision factory programming : Option 1

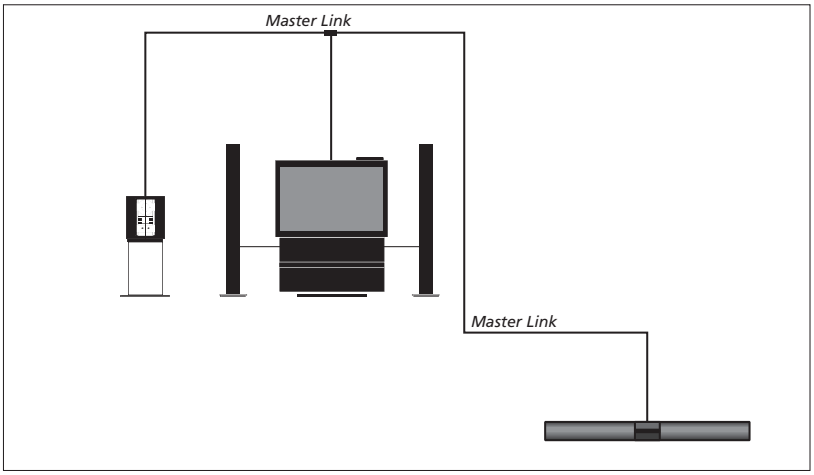
BeoSound option programming : Ready for use
BeoSound factory programming : Option 1

Special setups

Apart from the recommended setups there are two further combinations. They are not mentioned under recommended setups, as they do not fully live up to Bang & Olufsen's own requirements in respect of simple operation. We have chosen to describe the two setups in this separate section because in some situations they can be expedient and make it possible to operate all basic functions such as source selection (Radio, CD, A.Tape, etc.), source control (winding and rewinding, step, track selection, etc.) and volume adjustment.

The link room product or link room kit in the main room

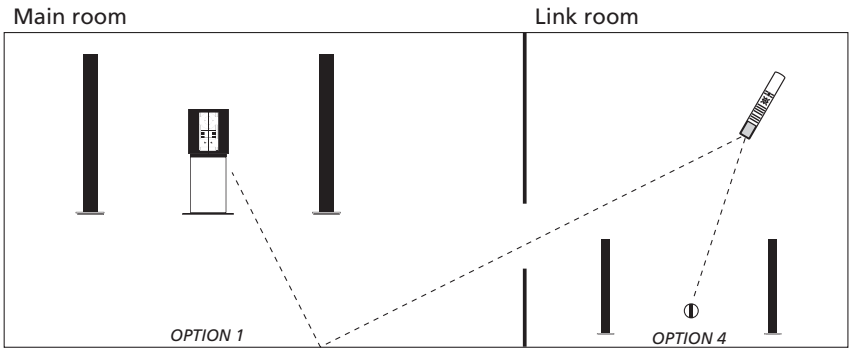
This setup is used when you want to have an extra sound zone in the main room, e.g. in an L-shaped room. It must be possible to operate the extra sound zone without activating the centrally placed AV system loudspeakers. In order to achieve this zone division you can fit link room products or link room kits.



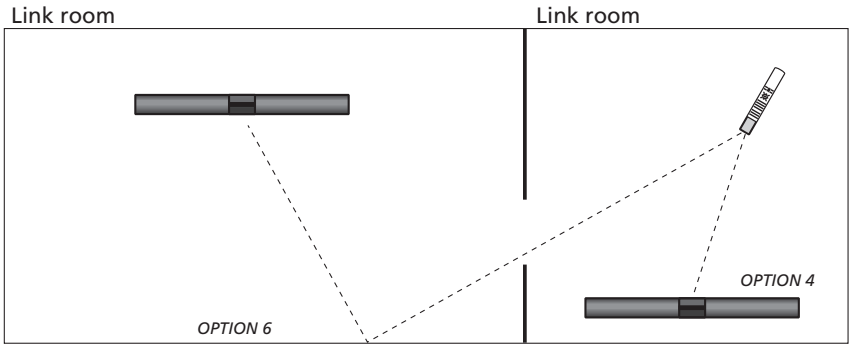
Option programming of link room product	:	Option 4
Audio/video system	:	See "Main room setups"

NB:
The AV system is operated as normal.
The extra sound zone only receives information from the remote control if the LINK key is activated for source selection (Radio, CD,A. Tape etc.)

Option 4 mentioned above can also be used if there are no walls separating a link room and a main room, and the product positioning in these rooms means that operation in one of the rooms leads to operation in another room. By setting the link room products to option 4 you allow the rooms to be used independently of one another, as a link room product set to option 4 only receives information from the remote control if the link key is activated.



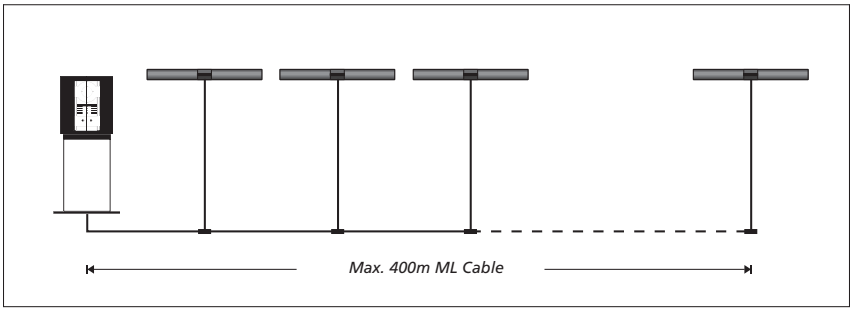
NB!
The BeoLink Video CANNOT be set to option 4!



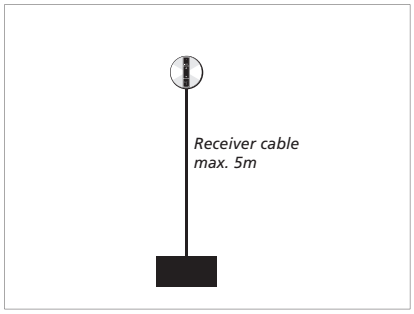
All link room products and link room kits using the Master Link connection can be used in this type of setup – with the exception of BeoLink Video.

NB!
BeoLab 3500 must be equipped with software version 1.1 or higher.

DIMENSIONING



A BeoLink system using Master Link can consist of up to 16 rooms, including the main room system's products. The total length of Master Link cable must not exceed 400 metres.



The cable between receiver and BeoLink Active must not exceed 5 metres (supplied).

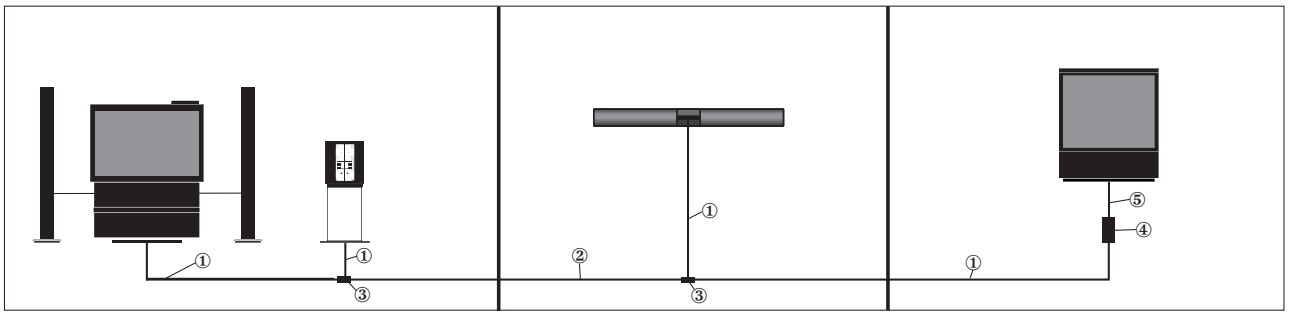
A special 15-metre low-capacity cable can be ordered, order no. 6270668.

INSTALLATION TYPES

In this section we explain in brief the two ways to perform installations, namely hidden and visible installation. The examples describe different ways of using Bang & Olufsen installation accessories, as described at the back of the manual.

The installations only show a couple of installation examples, but there is, of course, a whole range of other possibilities which we cannot go through in detail here.

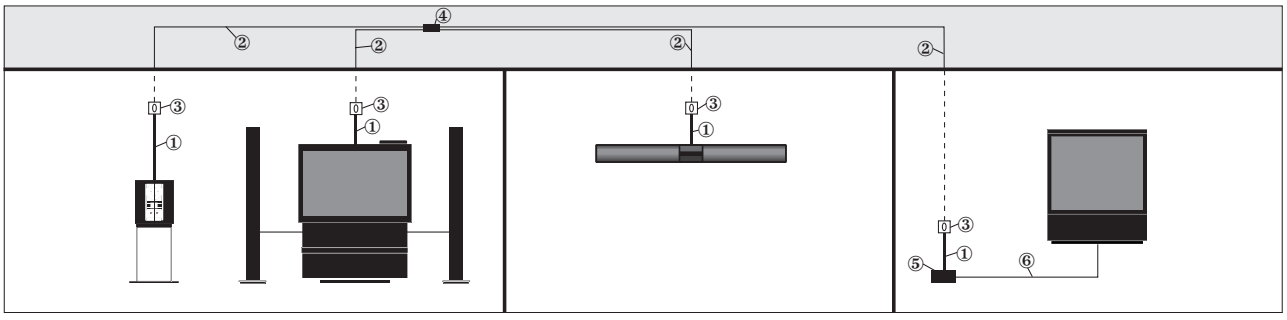
Visible installation



A visible installation is used when it is not possible to hide cables and installation materials in the loft and/or using cable conduits in the walls. In this example we have used:

1. 4 x Master Link cable with one plug
2. Master Link cable without plugs
3. 2 x Master Link junction boxes
4. 1 x BeoLink Video
5. 1 x Datalink cable (supplied with BeoLink Video)

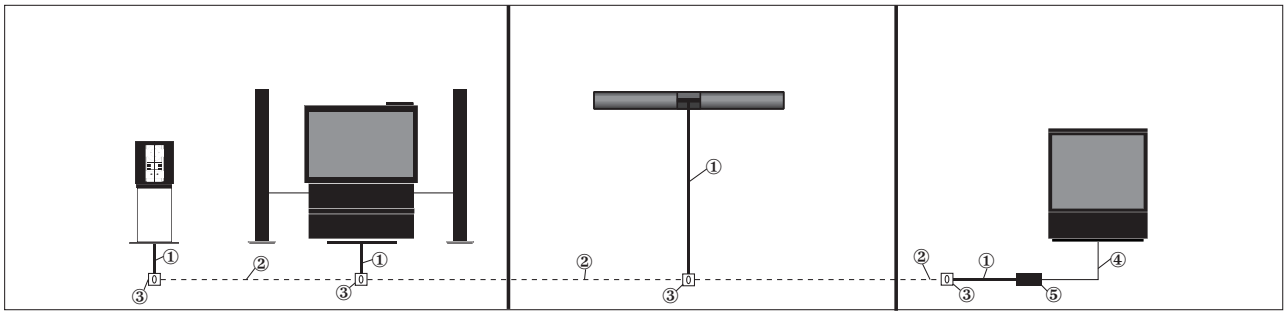
Hidden installation



In this type of installation you can hide cables and installation materials in walls and/or loft. In this example we have used:

1. 4 x Master Link cable with two plugs
2. Master Link cable without plugs
3. 4 x Master Link wall socket
4. 1 x Master Link junction box
5. 1 x BeoLink Video
6. 1 x Datalink cable (supplied with BeoLink Video)

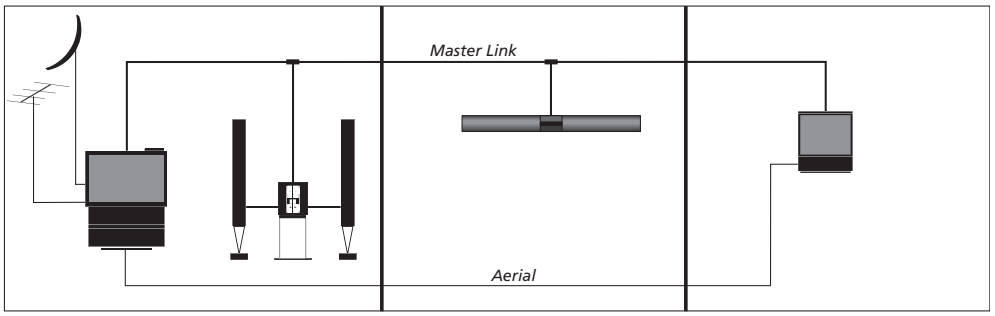
Another type of hidden installation is shown below. This type of installation can be used in apartments where there is no access to the loft or cellar.
In this example we have used:



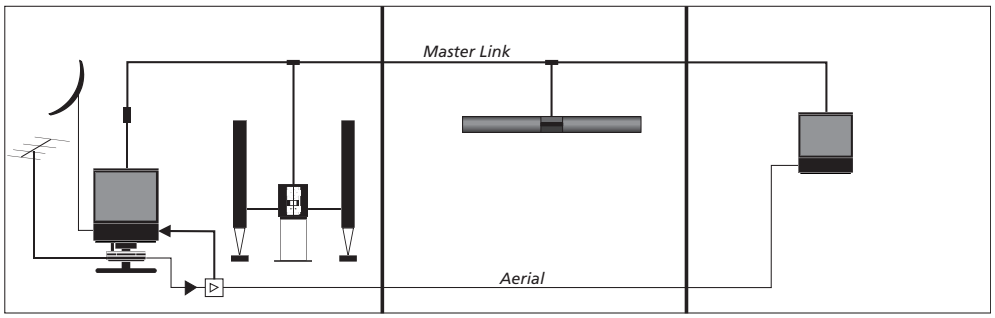
1. 4 x Master Link cable with two plugs
2. Master Link cable without plugs
3. 4 x Master Link junction boxes
4. 1 x Datalink cable (supplied with BeoLink Video)
5. 1 x BeoLink Video

Aerial installation

Aerial installation with built-in aerial splitter.



Aerial installation with external aerial splitter.

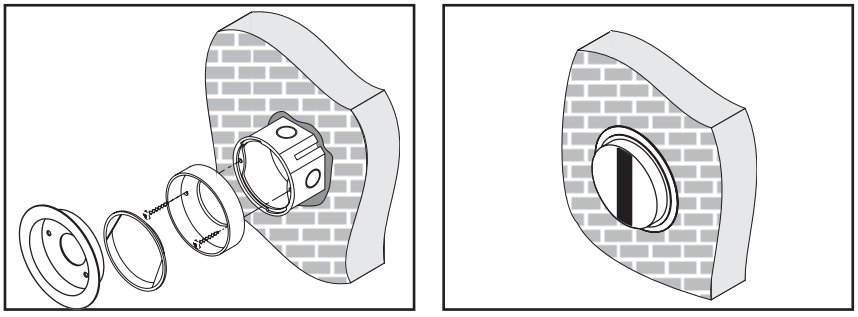


Incorporation kit for IR receiver

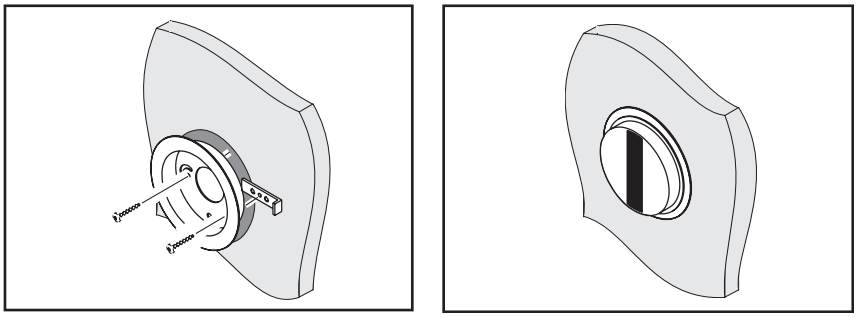
The incorporation kit for the IR receiver is used for invisible installations.

There are two types of incorporation kit.

One for solid walls (order no. 3375187) which consists of a flush-fit socket, a spacer, a plastic cover (for covering the socket during fitting) and a decorative ring.



The other kit is designed for partition walls (order. no. 3375188) and consists of two mounts and one decorative ring.

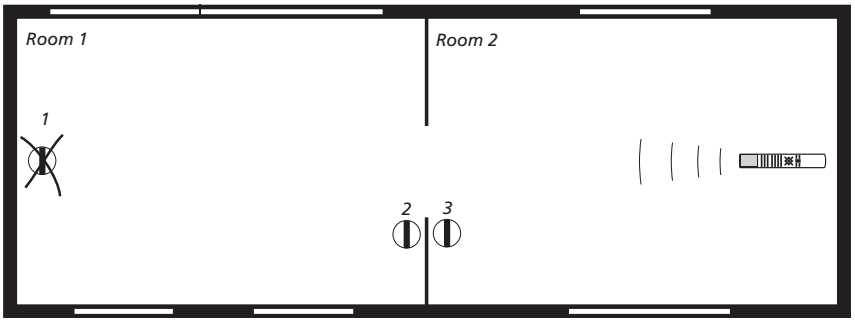


INSTALLATION TIPS

Positioning of IR receiver

The receiver must be positioned so that there is nothing preventing the reception of IR signals from a Bang & Olufsen remote control unit.

When you decide where you want to position an IR receiver, you must ensure that it is not possible to activate more than one receiver at the same time by remote control.



The illustration shows that IR receiver 3 is correctly positioned, while receiver 1 could unintentionally be activated from room 2. Receiver 1 must instead be positioned as shown for receiver 2.

The receiver must not be positioned in direct sunlight or direct artificial light (e.g spotlights) or in the vicinity of products that produce electric noise (e.g sound attenuators or plasma), as such positioning could reduce the sensitivity of the receiver (= shorter remote control distance).

If the receiver is positioned outdoors, you must be aware that it will not work at temperatures above 55° C or below 0° C. If there is a risk of the temperature being outside this range, it must be possible to disconnect the IR receiver using a switch, as it might otherwise prevent operation of the whole system.

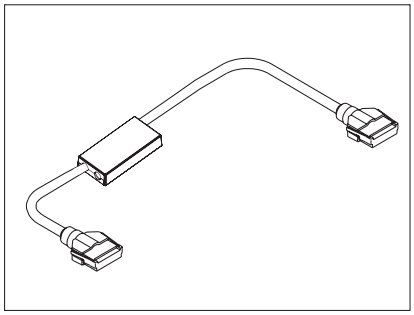
It is often a good idea to position the receiver near a door, as this makes local operation easy when you enter or leave the room.

It can also be a good idea to position the receiver close to a telephone so that the person who is telephoning can easily mute the equipment.

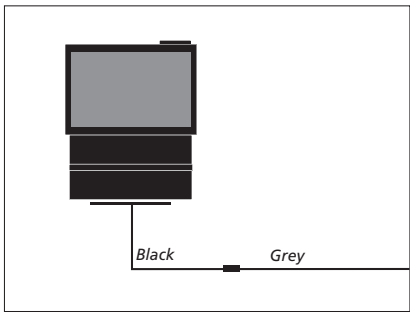
Positioning of the control box

The control box does not necessarily have to be positioned in the same room as the IR receiver, but may be positioned in the loft. Note, however, that the temperature may not exceed 40° C or fall below 10° C.

Use of Master Link junction box



1.
For cable length adjustment, e.g. from 10 metres to 8.5 metres.

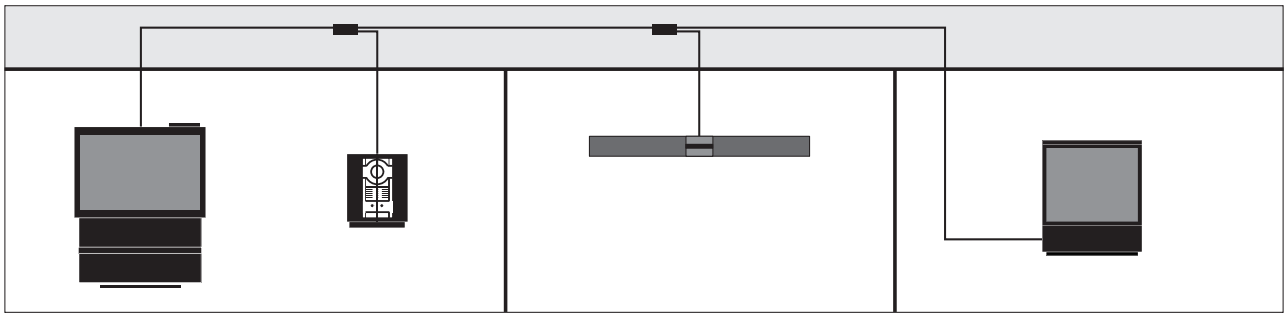


2.
For cable colour change in visible cable installations.

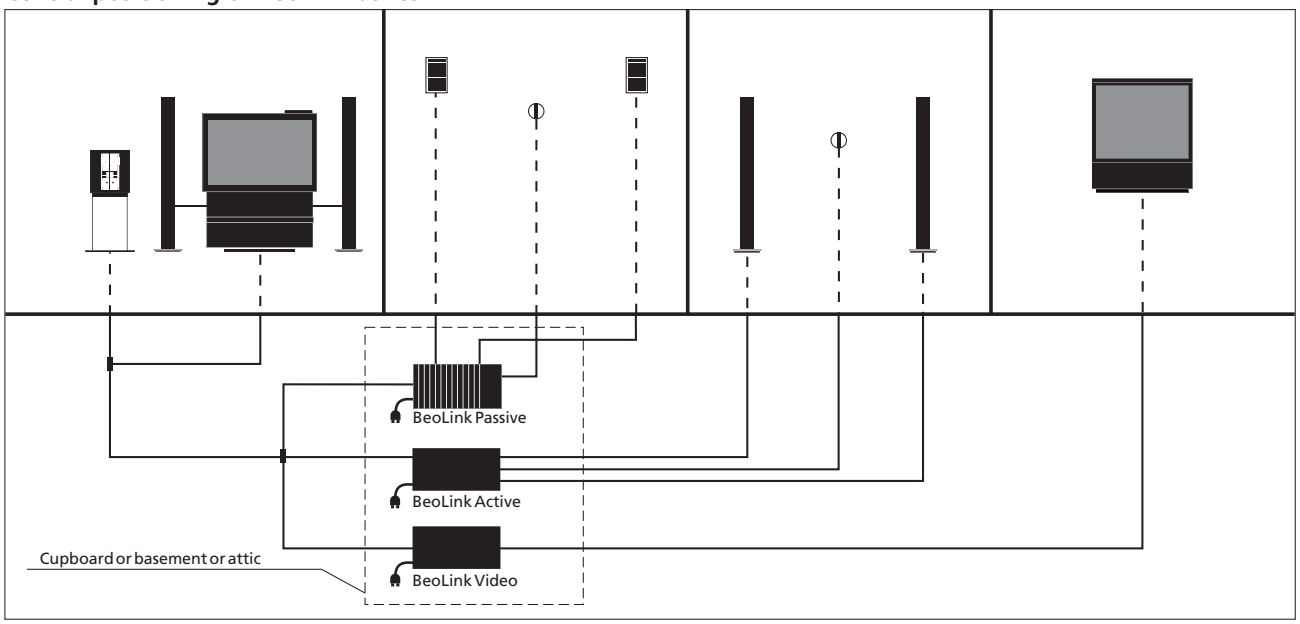
For aesthetic reasons all ML cables with plugs are black. When making visible installations, it can be desirable to use grey cabling along the walls, and the transition from black to grey is easily achieved using a junction box.

3.
Connection between products.

There can be a maximum of 4 ML cables per junction box.



Central positioning of BeoLink boxes



As can be seen from the illustration you can position BeoLink boxes centrally. Please note, however, that the maximum cable lengths may not be exceeded, and that you must observe the requirements for ambient temperature. See section on "Dimensioning", page 22, and "Positioning of control boxes", page 26, for further information.

Possible benefits of central positioning could, for example, be that the BeoLink boxes are easier to hide, that they can share a mains connection, etc.

The BeoLink boxes are designed for use within a temperature range of 10–40° C.

LexCom Home®/IHC Net®

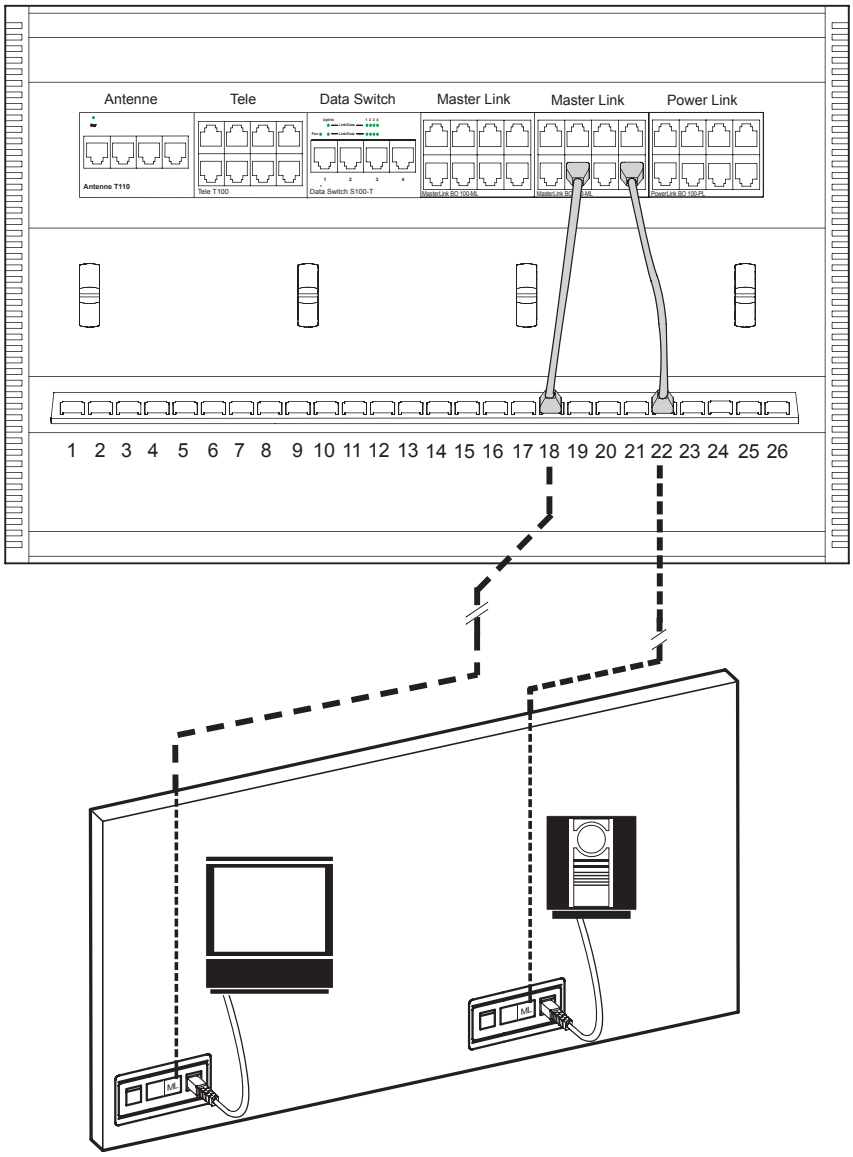
If you already have a LexCom Home®/IHC Net® installation you can use this network and its main panel for Master Link and Power Link distribution. Video distribution must, however, always be via a coaxial cable installed alongside the LexCom Home®/IHC Net® installation, as the latter does not support coaxial distribution.

Bang and Olufsen units are connected to LexCom Home®/IHC Net® wall sockets using special Master Link/Power Link cables for LexCom Home®/IHC Net®. These cables can be found in the accessories overview at the back of this manual.
The actual distribution is performed on the main panel, in exactly the same way as all other signals transmitted in a LexCom Home®/IHC Net® installation. The modules needed for the main panel can be purchased from your local installation retailer.
Module: BO100-ML is used for Master Link distribution.
Module: BO100-PL is used for Power Link distribution.

The total length of the cable carrying the Master Link signal must not exceed 400 m. This length covers both the Master Link cables and the LexCom Home®/IHC Net® installation cables.
If 16 units are connected to the system, the average length must not exceed 25 m, incl. the connecting cable from the equipment to the wall socket.

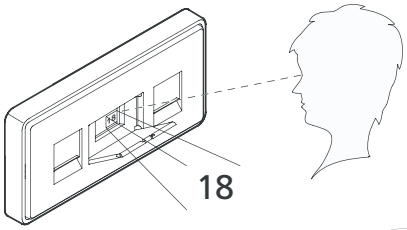
A maximum of 10 loudspeakers (5 sets) may be connected to each Power Link system. The total length for each system must not exceed 100 m. This length includes both the Power Link and the LexCom Home®/IHC Net® installation cables.

LexCom Home®/IHC Net® main panel – Master Link

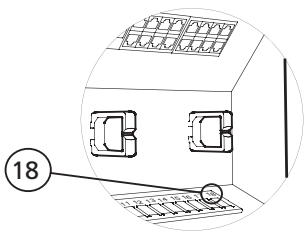


Connection procedure:

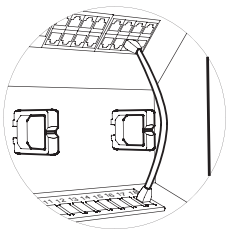
1. Determine the number of the socket where the equipment is connected.



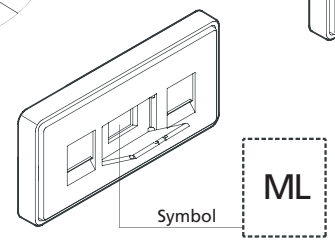
2. Go to the main panel and find the appropriate patch port.



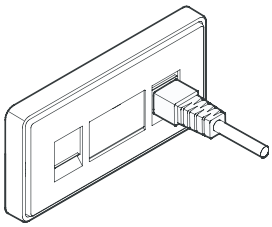
3. Patch from Master Link module to patch port.



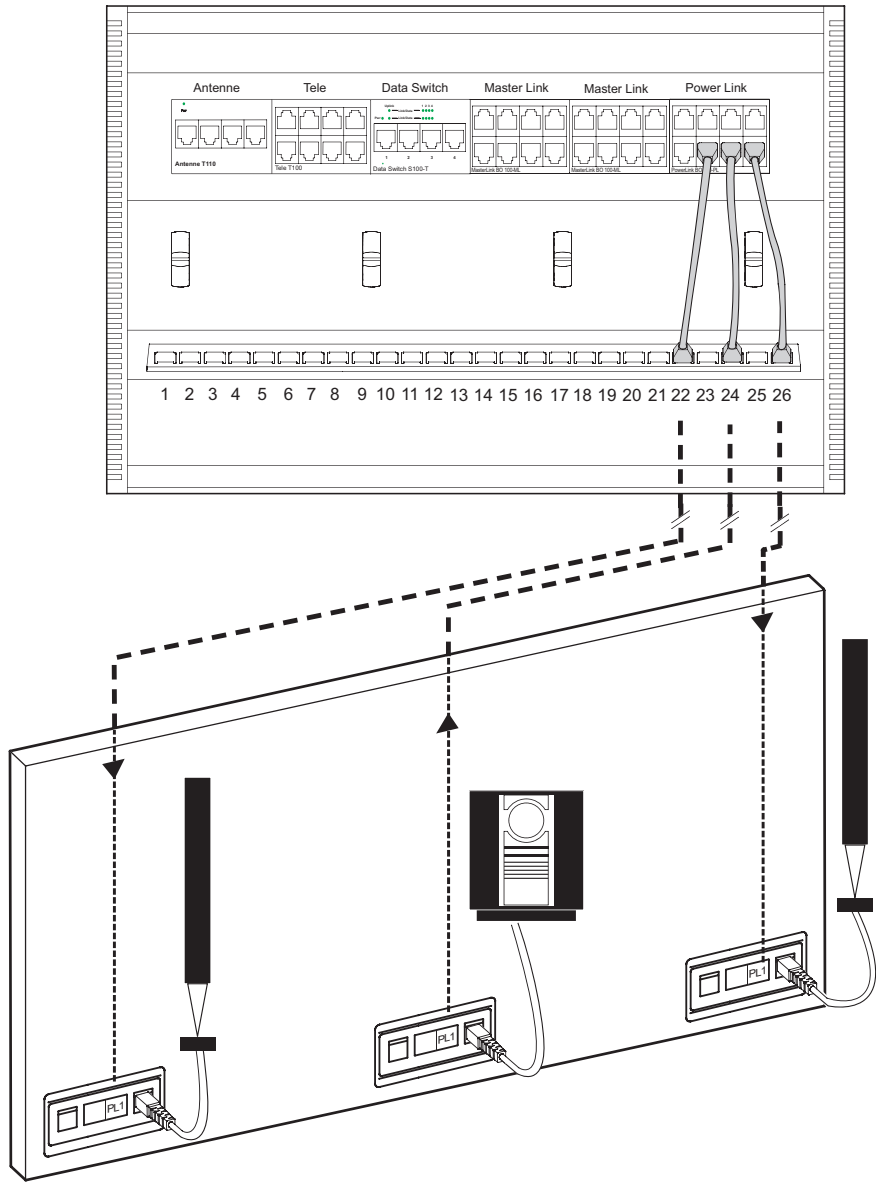
4. Go back to the wall socket and attach the Master Link symbol.



5. Connect the cable from the wall socket to the product.

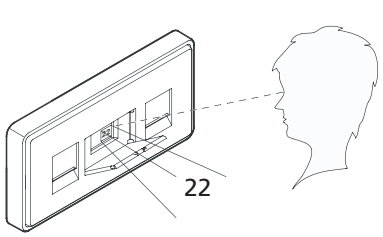


LexCom Home®/IHC Net® main panel – Power Link

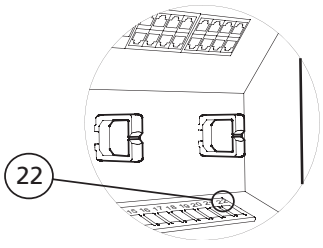


Connection procedure:

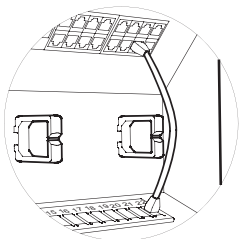
1. Determine the number of the socket where the equipment is connected.



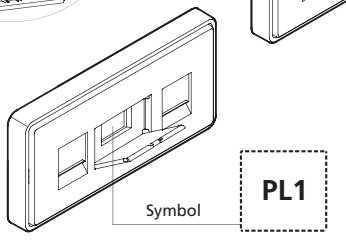
2. Go to the main panel and find the appropriate patch port.



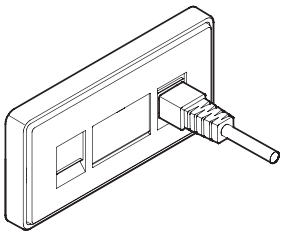
3. Patch from Power Link module to patch port.



4. Go back to the wall socket and attach the Power Link symbol.



5. Connect the cable from the wall socket to the product. Remember to set the Left/Right button on the loudspeakers.

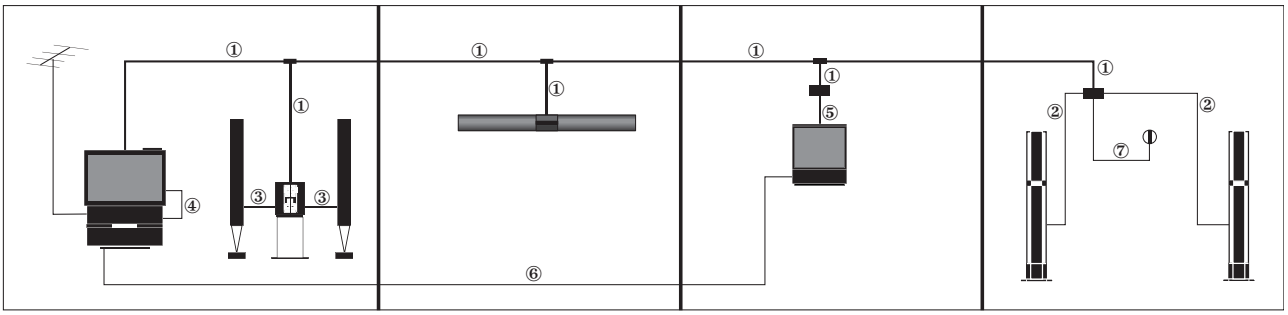


TECHNICAL DESCRIPTION

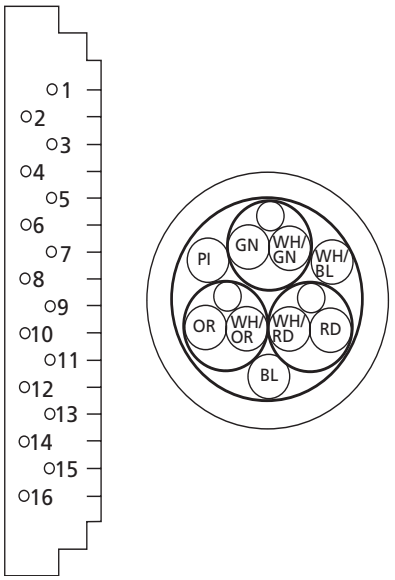
The following section contains a short description of the cable installations most often used in connection with a BeoLink installation.

Picture signals (from satellite and normal TV receiver and video recorder) are distributed through a 75 ohm coax cable.

Descriptions of the spare part numbers can be found in "Accessories".

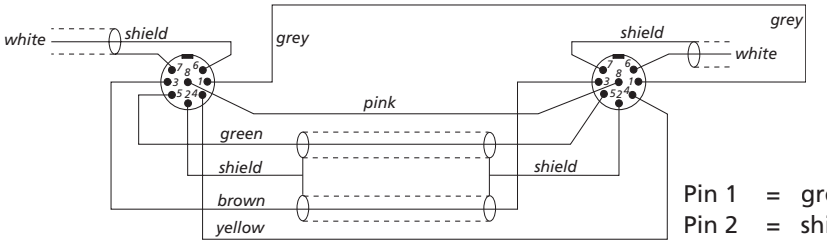


① Master Link cable



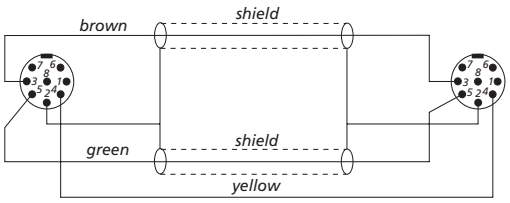
Pins in Master Link plug	Cable colour	Function
1	white/green (WH/GN)	Data -
2	green (GN)	Data +
3	white/blue (WH/BL)	ML sensor
4-10		No connection
11	blue (BL)	- supply voltage
12	pink (PI)	+ supply voltage
13	white/orange (WH/OR)	- L (left channel)
14	orange (OR)	+ L (left channel)
15	white/red (WH/RD)	- R (right channel)
16	red (RD)	+ R (right channel)
Shield	3 x solid cable	ground

② Power Link cable with core for display data



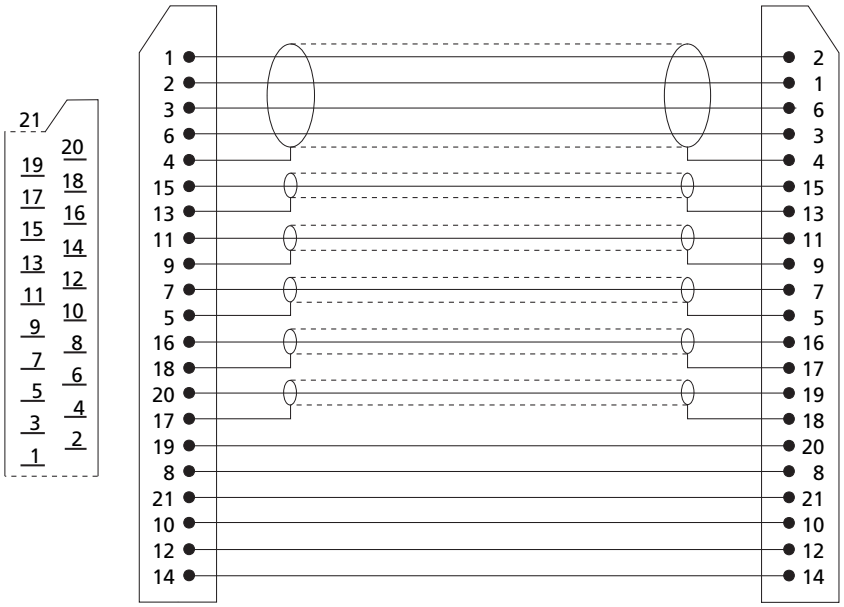
Pin 1	=	grey	=	grey	= power up/down
Pin 2	=	shield	=	shield	= ground
Pin 3	=	brown	=	brown	= signal, left channel
Pin 4	=	yellow	=	yellow	= loudspeaker relay
Pin 5	=	green	=	green	= signal, right channel
Pin 6	=	white	=	white	= Datalink
Pin 7	=	shield	=	shield	= ground
Pin 8	=	pink	=	pink	= overload

③ Power Link cable without core for display data



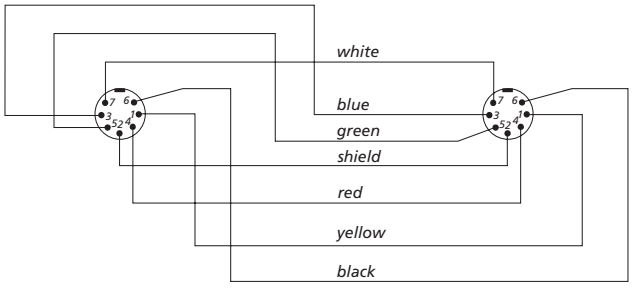
Pin 2	=	shield	=	shield	=	ground
Pin 3	=	brown	=	brown	=	signal, left channel
Pin 4	=	yellow	=	yellow	=	loudspeaker relay
Pin 5	=	green	=	green	=	signal, right channel

④ 21-pin A/V cable with RGB connection



Pin	1	=	sound out, right channel
Pin	2	=	sound in, right channel
Pin	3	=	sound out, left channel
Pin	4	=	sound ground
Pin	5	=	blue ground
Pin	6	=	sound in, left channel
Pin	7	=	blue signal (C out)
Pin	8	=	12 V control voltage and Datalink
Pin	9	=	green ground
Pin	10	=	data 2
Pin	11	=	green signal
Pin	12	=	data 1
Pin	13	=	red ground
Pin	14	=	fixed blanking, ground
Pin	15	=	red signal (C in)
Pin	16	=	fixed blanking
Pin	17	=	video out, ground
Pin	18	=	video out, set
Pin	19	=	video out, signal (Y out)
Pin	20	=	video in, signal (Y in)
Pin	21	=	shield, ground

⑤ Datalink cable

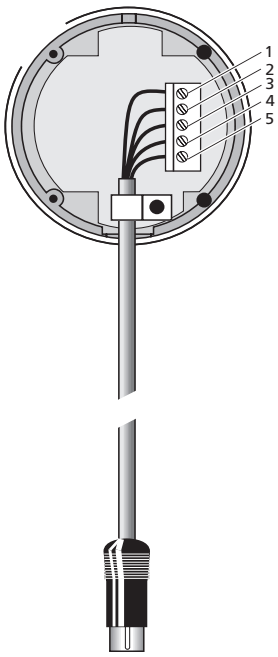


Pin 1	=	yellow	=	yellow	=	out, left channel
Pin 2	=	shield	=	shield	=	signal, ground
Pin 3	=	blue	=	blue	=	in, left channel
Pin 4	=	red	=	red	=	out, right channel
Pin 5	=	green	=	green	=	in, right channel
Pin 6	=	black	=	black	=	data ground
Pin 7	=	white	=	white	=	datalink

⑥ Coax cable

For information on the coax cable for aerial installation, see section on aerial installation, page 24.

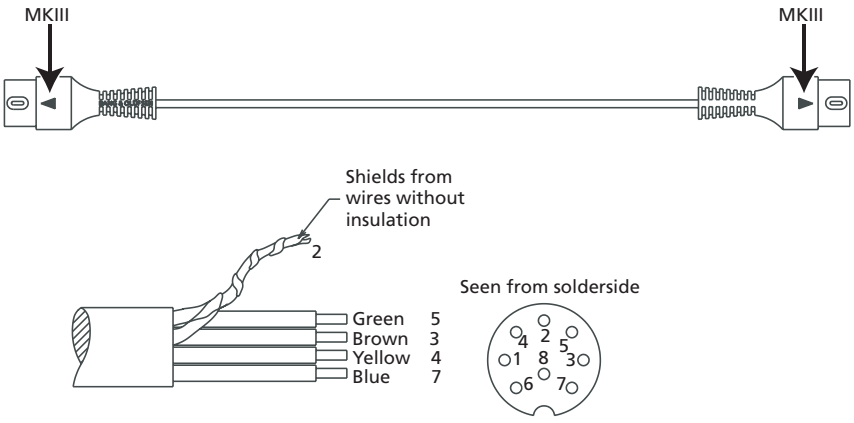
⑦ **Receiver cable**



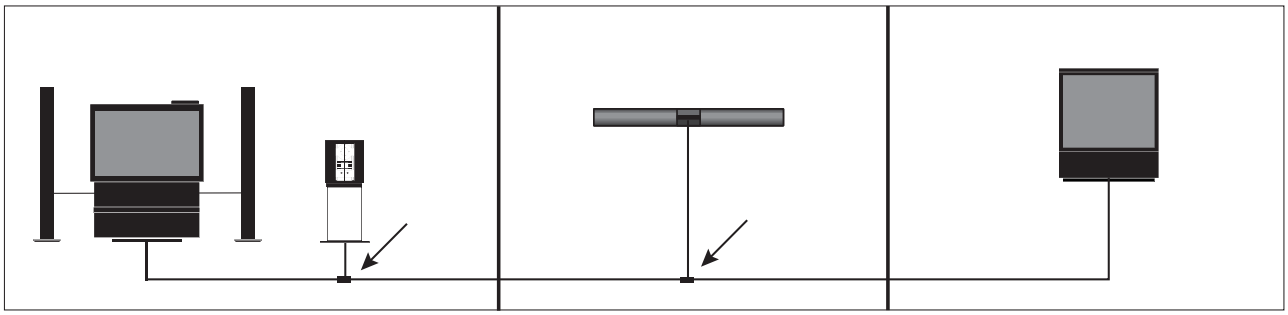
1 = Yellow
2 = Grey
3 = Green
4 = White
5 = Brown

NB:
All Bang & Olufsen products in the system must be disconnected from the power source during installation!

Power Link cable
Ø2.5mm

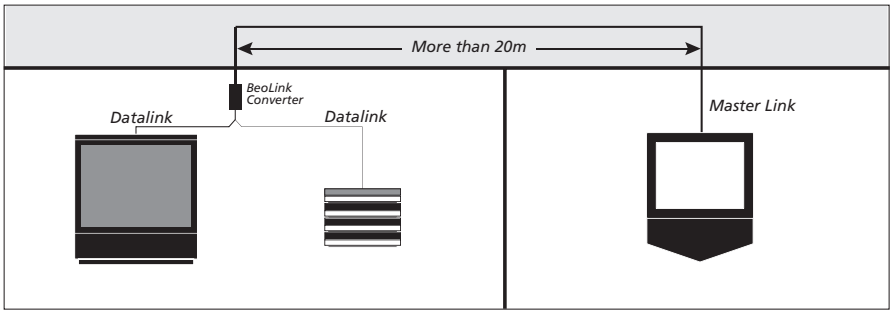


TROUBLESHOOTING

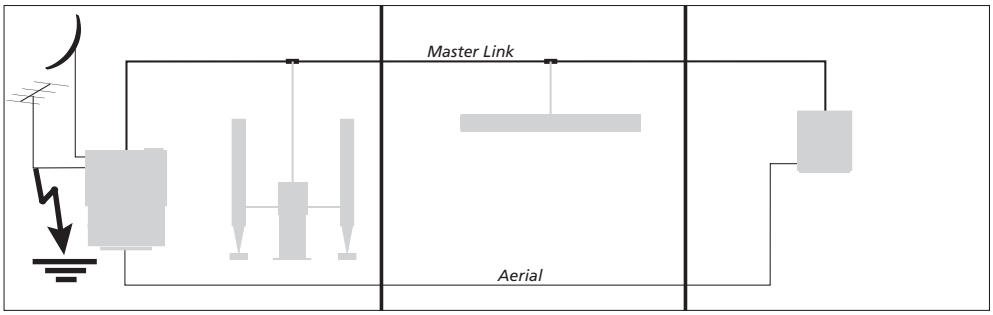


The isolation method is the first course of action when troubleshooting a Master Link installation. Start by disconnecting the link rooms in order to find out if the fault is in the main room or the link rooms. Then connect the link rooms one by one until the fault is discovered. This is a quick way of finding out if the problem is in the main room, or identifying the link room that is the cause of the problem.
If there are no junction boxes in the system, you can also disconnect the link rooms by disconnecting the Master Link plug from the products.

It is also possible to use the LED tester, which is a circuit tester used to locate poor connections and broken connections in an ML system. This tester allows you to localise faults very quickly in the individual cores of the ML cables. All products must be disconnected while these tests are being carried out (see page 40).



In a system where two masters (e.g. BeoLink Converter configured as master) are connected and where the total length of the Master Link cable is over 20 m, you should make a short-circuit of the Master Link cable. This short circuit is incorporated into junction boxes, so if the system includes a junction box you do not need to create the short circuit. The short circuit must be made between pin 3 (white/blue) and pin 12 (pink) and can be made in one of the products, in a wall socket, or by fitting a junction box. In case of doubt the short circuit should be made on the ML cable regardless of the system setup. Without the short circuit, the following faults can arise: All link audio functions work, but link video functions do not work.



Do you experience any of the following with the Master Link system: The video jams (red bar on the shield), humming in the front loudspeakers, clicking in the rear loudspeakers when they are not in use, humming in all loudspeakers, or no communication between AV products?
If this is the case you should check whether the aerial is grounded. If not, we recommend creating a ground connection from here.

Simple Master Link measurements can be made either using a voltmeter or, preferably, an oscilloscope.
All specifications are measured to ground using an oscilloscope.

The following specifications apply to Master Link:

Pin no. in Master Link plug	Cable colour	Function	Specification
1	white/green	data -	-0.25 V ± 0.1 V
2	green	data+	+0.25 V ± 0.1 V
3	white/blue	ML sensor	
4 - 10	No connection	(N.C.)	
11	blue	- supply-voltage	-7 V to -15V Stndby -3V to -15V
12	pink	+supply-voltage	+7 V to +15 V Stndby +3V to +15V
13	white/orange	sound -L	1 V Bal Rin 2.2 Mohm, Rout 75 ohm
14	orange	sound +L	1 V Bal Rin 2.2 Mohm, Rout 75 ohm
15	white/red	audio -R	1 V Bal Rin 2.2 Mohm, Rout 75 ohm
16	red	audio +R	1 V Bal Rin 2.2 Mohm, Rout 75 ohm
Shield	3 x solid cable		Ground

Data speed is 19,200 bits/sec.
By way of comparison, the Master Control Link data speed is 160 bits/sec.

Fault
No sound and no operation

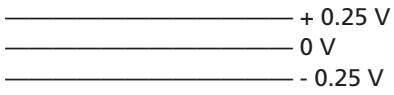
Possible cause
The product is connected to mains and the stand-by LED is illuminated. If this is OK, do the following:

- Measure data+ (pin 2) relative to ground.
- Measure data- (pin 1) relative to ground.
- When there is no transmission the reading should be between +/- 200 and 300 mV.
- When data is being transmitted it should read 0V.

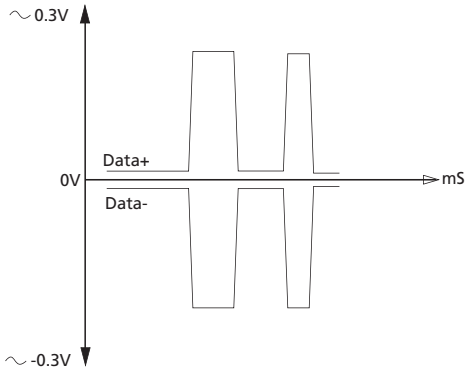
Reading using an oscilloscope.

Measure the following:

No transmission



Transmission



If data- and data+ are not as indicated in "No transmission" and are unable to transmit, there may be a fault in the main room BeoVision or BeoSound, as one of these supplies the voltage.

Note that with setups using BeoLink Converter it is always the Master Link driver that supplies the voltage. If there are two Master Link drivers in the system, one will configure itself as supply master when connected.

The fault is found using the isolation method. If the fault is not in one of the Master Link drivers, there is another unit pulling data either low or high. There could also be a cable fault or connection fault. Data faults can also be read off in service mode, see section on service mode.

If the data is OK, proceed to reading the supply voltage, which must be as indicated under specifications. If the voltage is not OK, use the isolation method until you find the faulty equipment or faulty connection.

No sound but operation OK

Data and supply voltage are OK. Measure the signal level for pin 13 to 16 in relation to the specifications. If the signal level is OK, there is a fault with the link room product, possibly the converter box, cables or a connection fault.

Playing is at half volume

One of the balanced sound signals is missing.

Service mode

Products with a display have a service mode where Master Link faults can be read off. Note that the fault reading indicates that there is a system fault; this is not the same as saying there is a fault with the actual product where the fault message appears.

BeoLab 3500 and BeoVision Avant are examples of products with service mode. See service instructions for the individual product to find out how you can access service mode and the possibilities provided by service mode.

The example of service mode below is from BeoLab 3500.

ERROR 1: - Address configuration is impossible.

Fault with address configuration. No address was found, because there are too many units connected to the Master Link.

- Remove all products from the Master Link connection and reconnect them one by one other until the fault appears. Disconnect the product again.

ERROR 2: - Master Link data pulled low.

It is not possible to transmit on the Master Link because it is pulled low. This fault can arise if there is no Master Link driver circuit, or as a result of a physical short circuit in the Master Link or in the data receiver circuit.

- Remove the products from the Master Link connection one by one and see if it starts again.
- Reset the faulty product and check the connection (cable/plug) and signal path (data receiver circuit). See section on repair tips for a description of the data receiver circuit.

ERROR 3: - Master Link data pulled high.

It is not possible to transmit on the Master Link because it has been pulled high. This fault arises either because the pull-up resistance in the system has become too small, or as a result of a fault in the data receiver circuit.

- Remove the products from the Master Link connection one by one and see if it starts again.
- Reset the faulty product, check if the Master Link cable is too long, and check the signal path (the data receiver circuit). See section on repair tips for a description of the data receiver circuit.

ERROR 4: - Data collision on Master Link.

The data traffic on the Master Link has been unusually high, or a product is blocked and cannot receive data telegrams.

- Repeat the operating sequence.
- Remove the products from the Master Link connection one by one in order to find out which product is blocked. Reset the faulty product and check the Master Link connection (cable/plug) and signal paths (the amplifiers in the data receiver circuit).

See the service guide for individual products if you require further information.

GLOSSARY

21-pin AV cable/SCART	Standard cable for connecting a TV to different video sources, typically a video recorder. The cable is specified for RGB signal transmission.
Audio Aux Link	Audio Aux Link is the name of the 7-pin Datalink connection between the audio and video master in the main room. When this was launched it became possible to achieve a high degree of integration between audio and video systems and therefore AV integration. In the latest generation of products, the Audio Aux Link connection has been replaced by Master Link.
AV setup	Setup using a connected audio and video system with two masters, which makes it possible to move the sound from one system to another.
AV system	Audio/video system Integration of audio and video where there is only one master which manages all operations.
BeoLink	Sales description and overall description of Bang & Olufsen's method of distributing sound and images to other rooms in the home. BeoLink can be achieved in various ways depending on the products used in the setup: basically either using Datalink/Master Control Link (MCL) or using the Master Link system.
Beomaster	The control unit or audiomaster in component-based audio systems, e.g Beomaster 7000. For future products this designation will be replaced by BeoSound.
BeoSound	Common name for audio products, e.g. BeoSound Ouverture. Part of a new name structure for Bang & Olufsen products, in which all future audio products will be called BeoSound.
BeoVision	Common designation for TV and video systems, e.g. BeoVision MX 6000 and BeoVision Avant. Part of a new name structure for Bang & Olufsen products in which all future video products will be called BeoVision.
Datalink cable	7-pin datalink cable used for the Audio Aux Link connection between audio and video systems in the main room. In the latest generation of products the cable is replaced by the Master Link cable.
One-way remote control	A remote control which operates the products by sending a command to them without requiring a response back (e.g. BeoLink 1000 and Beo4). BeoLink 5000 and BeoLink 7000 are two-way remote controls where responses from the product are required.
Main room	Designation for the room(s) in the house where the central system is located, and from where any distribution to other rooms takes place. The main room can contain an audio, a video or an AV system. There are basically two types of main room: One room setups: audio and video systems positioned in the same room Two room setups: audio and video systems in two different rooms.
Main room products	Product(s) that can be drivers in a BeoLink system, e.g. BeoVision Avant and BeoSound Ouverture.

IR receiver	IR receivers are built into video, audio and link products and receive infrared signals from a remote control. This enables the products to be operated using a BeoLink 1000 or Beo4.
Compatibility	Ability to combine products from different seasons and with different interfaces.
Control box	Box that controls data and signals, e.g. in BeoLink Active.
Link room	Designation for the room(s) in the house where kits or products are installed that facilitate distribution from a main room system.
Link room kit	Kits designed specifically for link rooms, e.g. BeoLink Active and BeoLink Video.
Link room product	Products designed specifically for link rooms, e.g. BeoLab 3500.
Master Control Link (MCL)	Master Control Link is the name of the connection used up until today between the main room and link room. Gradually replaced from the 1994/95 season by the Master Link connection on launch of new products.
Master Link (ML)	Bang & Olufsen's new system connection. Master Link is the name of the connection between the audio and video system in the main room. See section "General description".
Master Link driver	BeoSound and BeoVision with Master Link socket. A Master Link driver is always required in a Master Link setup.
Master Link product	All products with a Master Link socket.
Option programming	Option programming is performed using a Bang & Olufsen remote control. The products that need to be option programmed must be on stand-by. Using the option programming you tell the products what type of setup they are part of so that they can be operated and function optimally.
Power Link (PL)	Bang & Olufsen connection between a master and active Bang & Olufsen loudspeakers, with signals at line level. There are two versions of the cable: one type with both line signals for display readout (8-pin) and a thinner type without data signals for display readout (4-pin) The latter cannot be used for loudspeakers with a display.
Product Configuration Guide (PCG)	A PC-based tool that makes it possible to compose the desired product setup and provides answers to questions regarding compatibility, setups, options, remote controls, special considerations etc., so that a system in the customer's home can be dimensioned optimally and be free from errors.

LED tester

Simple circuit tester for troubleshooting Master Link/Power Link systems. Using this tester you can quickly find breaks or poor connections in the system.

Professional tool for troubleshooting ML/PL installations.
Circuit tester for connections/cables and sockets.

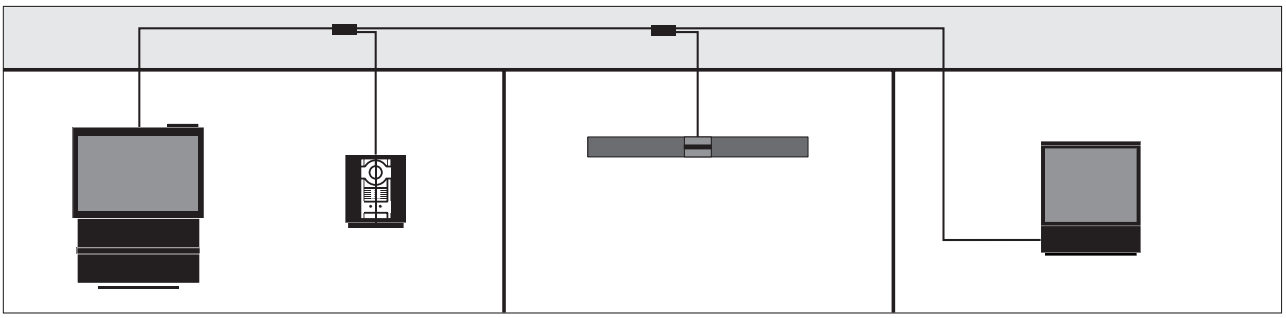
8053404 ML/PL cable tester

This LED tester consists of two boxes and two Master Link cables.

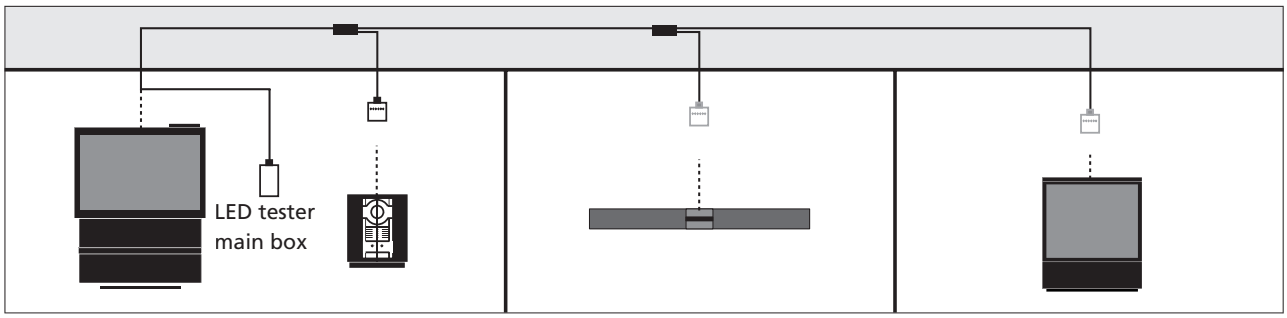
The main box connects to the Master Link system. When turned on, the main box sends an electric pulse through each individual core in the Master Link cable.

The LED box can then be connected to the remaining Master Link connections one by one. A range of LEDs will light up as the main box sends the pulses through the individual cores. This enables you to easily see if there is a circuit in all cores and thus locate the defective link (e.g. junction box or wall socket). If an LED is weakly illuminated it means that there is a poor connection. There is also an output and input for testing Power Link cables.

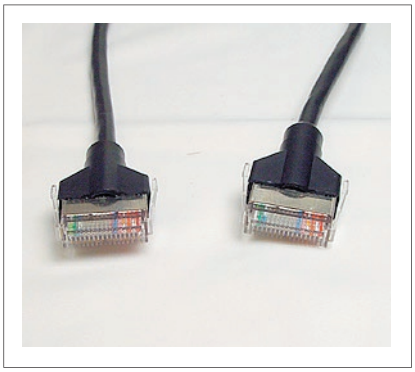
The illustration shows typical Master Link system connections. We will use this system as an example to show how the LED tester tests the Master Link cable circuits.



All products must be disconnected during the test, as it would otherwise be impossible to circuit test the cables due to short circuits in the products. Connect the main box to the main room, for example, and then proceed to connect the LED box to all Master Link connections one by one until you locate the junction box causing the problem (in this example there are only junction boxes). The small extra cables supplied can be used if you suspect that a cable between a product and a wall socket is faulty.



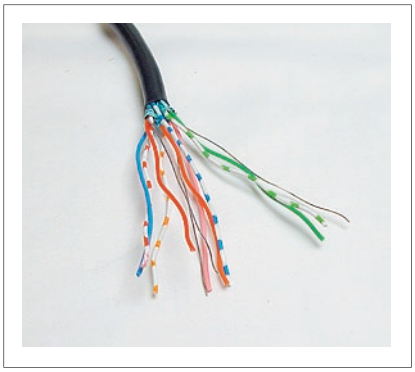
ACCESSORIES



Master Link cable

Used for connecting two products or a wall socket and a product. Ø 6.5 mm.

6270632	3.0 m with one plug, black
6270708	0.5 m with two plugs, black
6270709	1.5 m with two plugs, black
6270631	3.0 m with two plugs, black
6270711	5.0 m with two plugs, black
6270633	10.0 m with two plugs, black
6270635	20.0 m with two plugs, black
6270047	3.0 m with one socket, white
6270048	0.5 m with two plugs, white
6270049	1.5 m with two plugs, white
6270050	3.0 m with two plugs, white
6270052	5.0 m with two plugs, white
6270056	10.0 m with two plugs, white
6270059	20.0 m with two plugs, white



Master Link cable without plugs

Master Link cable in metre lengths. Used for connecting wall sockets. Ø 6.5 mm.

6250418	100 m, grey
6250422	100 m, black
6250423	100 m, white

Power Link cable

Signal and control cable between two Power Link sockets, with core for display data. Ø 3.5 mm

6270687	2.5 m, black
6270688	5.0 m, black
6270689	10.0 m, black
6270696	20.0 m, black
6270063	2.5 m, white
6270064	5.0 m, white
6270065	10.0 m, white
6270066	20.0 m, white
6250404	100 m without plugs, black
6250438	100 m without plugs, white

Power Link cable

Signal and control cable between two Power Link sockets, without core for data display. Ø 2.5 mm.

6270077 0.5 m, black
6270078 2.5 m, black
6270079 5.0 m, black
6270080 10.0 m, black
6270081 20.0 m, black

6270082 2.5 m, white
6270083 5.0 m, white
6270084 10.0 m, white
6270085 20.0 m, white

6250462 100 m without plugs, black

AUX T-plug

Used for connecting a BeoLink Converter plus an audio and a video product with Datalink connections.

6270702

Power Link T-plug

Used for serial connection of active loudspeakers.

6270706 0.3 m
6270705 1.6 m

Datalink cable

For connecting two products or a wall socket and a product.

6270222 1.5 m with two plugs, black
6270639 3.0 m with two plugs, black
6270353 5.0 m with two plugs, black
6270337 10.0 m with two plugs, black
6270354 20.0 m with two plugs, black
6250265 100 m without plugs, black

6270393 1.5 m with two plugs, grey
6270640 3.0 m with two plugs, grey
6270394 5.0 m with two plugs, grey
6270395 10.0 m with two plugs, grey
6270396 20.0 m with two plugs, grey
6250269 100 m with two plugs, grey

6270338 1.5 m extension cable, black

Low-capacity cable

Used for connecting an IR receiver and a BeoLink Active/Passive where more than 5 m cable is required.

6270668 15 m, white

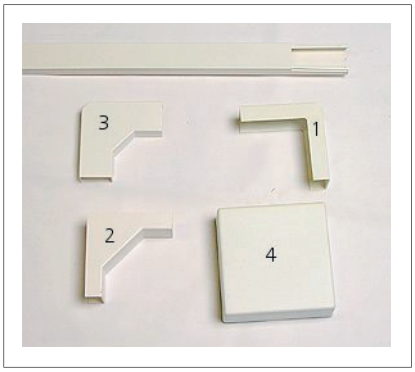
DIN plug, male

Plugs for the relevant cables, e.g. Power Link, Datalink etc.

7220163 7-pin, black
7220688 7-pin, grey
7220701 7-pin, grey, angle
7220573 8-pin, black
7220345 8-pin, grey

Coax plug

7220026 Male, metal
7211072 Female, metal



Cable tray, narrow

2560257 2.5 m, white

Internal dimensions: 8 x 18 mm.
Comes in packs of 10.

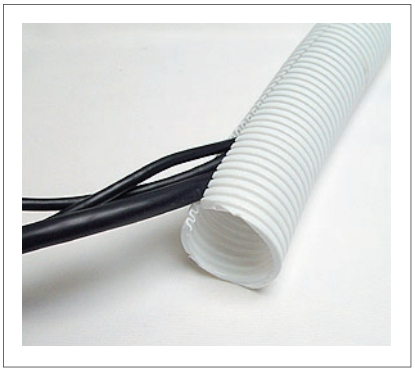
2548255 External corner (1)
2548256 Internal corner (2)
2548257 L piece (3)
7219071 Branch box (incl. special terminal block f. MCL) (4)
2369117 Nail plugs (100) for fitting

Cable tray, semi-circular

For hidden installation of BeoLab 3500 fitted on a wall.

2560276 2.5 m, white

Comes in packs of 10.

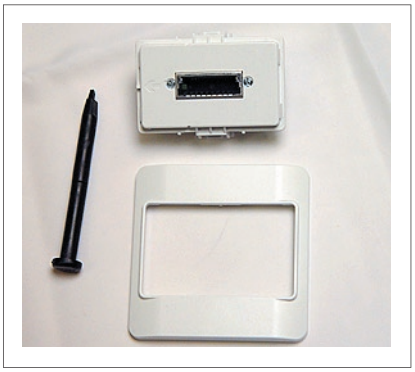


Cable tray, flexible

Flexible plastic conduit.
Internal diameter 23 mm.

Comes in 10 m rolls.

2952033 White



Wall socket

Wall socket with Master Link socket. Solder-free terminals Used for Master Link connection, between rooms or between Master Link product and wall socket.

7210937 72 x 50 mm, grey (DK)
7210938 72 x 50 mm, white (DK)
7210940 80 x 80 mm, white (EURO)

Wall socket, 8-pin DIN

Wall socket with 8-pin DIN bushing with solder terminals.
Used as plug connection between audio system and wall socket.

7210675 49 x 49 x 24 mm, white (DK)
7210473 49 x 49 x 24 mm, grey (DK)
7210512 80 x 80 x 24 mm, white (EURO)

Flush-fit socket

DK flush-fit socket for fitting in wall. Used for recessed fitting in brick or plaster walls.

Dimensions: 80 x 83 mm

7219089

Base

DK wall socket base. Used for fitting on external walls.

Dimensions: 80 x 53 x 30 mm

7210898 grey
7210899 white

Wall socket base. Used for fitting on external walls.

Base

7210681	49 x 49 mm wall socket, white (DK)
7210474	49 x 49 mm wall socket, grey (DK)
7219092	80 x 80 mm wall socket, white (EURO)

Flush-fit socket for fitting in wall. Used for recessed fitting in brick or plaster walls.

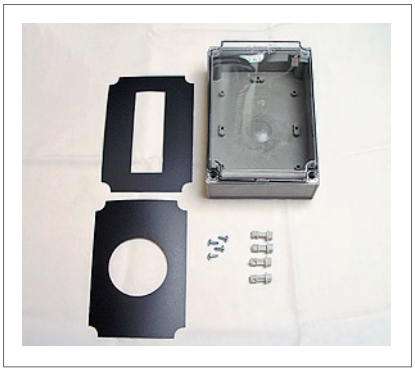
Flush-fit socket

7219048	52 x 52 x 37 mm (DK)
7219090	71 x 71 x 44 mm (EURO)

Plate for covering installations that are not being used.

Covering plate

3164593	49 x 49 x 24 mm, grey (DK)
3164707	49 x 49 x 24 mm, white (DK)



Outdoor socket for ML and MCL transceiver.

Dimensions: 75 x 125 x 175 mm

3132221

Outdoor socket

Used for invisible installations in solid walls.

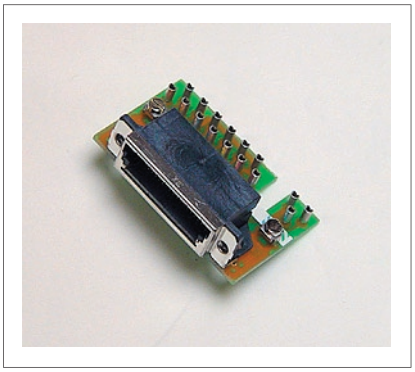
3375187

Flush-fit kit for ML transceiver, solid wall

Flush-fit kit for ML transceiver, light partition wall

Used for invisible installations in light partition walls.

3375188



ML socket

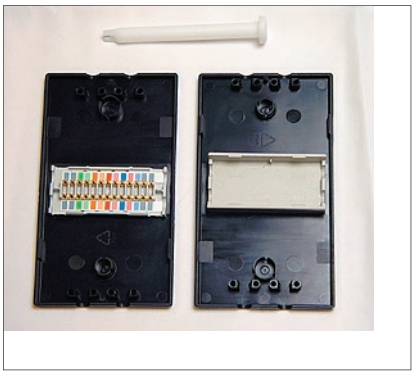
Master Link socket for fitting in extra wall socket (with blanking cap).

8009947

ML junction box, small

Used for shortening ML cables, for cable colour change and for connecting products.

3132170	black
3132197	grey
3132220	white



ML junction box, large

Used for Master Link connections between products.

3375189	black

Tools

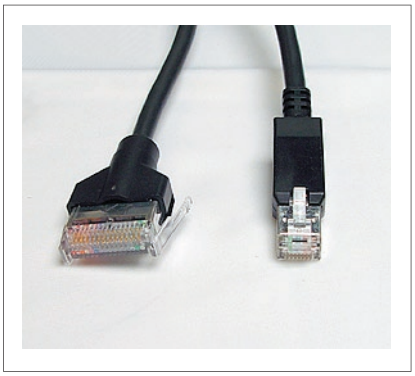
Professional tool for fitting ML cables.

3629127	For fitting in ML wall socket
3629132	For fitting in ML junction box

Adapter from B&O Power Link to LexCom Home®/IHC Net®

PL-LexCom Home®/IHC Net®

6270017	1.5 m	black
6070020	3.0 m	black
6270004	5.0 m	black
6270022	10 m	black
6270023	1.5 m	white
6270024	3.0 m	white
6270025	5.0 m	white
6270026	10 m	white



Adapter from B&O Master Link to LexCom Home®/IHC Net®

ML-LexCom Home®/IHC Net®

6270006	1.5 m	black
6270011	3.0 m	black
6270002	5.0 m	black
6270012	10 m	black
6270013	1.5 m	white
6270014	3.0 m	white
6270015	5.0 m	white
6270016	10 m	white

Professional tool for troubleshooting ML/PL installations.
Circuit tester for connections/cables and sockets.

Cable tester

8053404	ML/PL cable tester

Professional tool for fitting Master Link plug on Master Link cable.
Plugs ordered separately.

ML tool

3624032	ML crimp tool complete with bag
3624042	1 set of pliers (1)
3624040	1 set of pliers (2)
3624041	1 crimp head (3)
3624043	1 stripping tool (4)

Master Link plug for fitting on Master Link cable. Fitted using ML tool.

Supplied in bags of 25.

ML plug

3390548	ML plug

Spare parts for ML pliers, from ML tool bag.

ML tool maintenance

3032033 Adjustment wheel (1)
2816378 Lock spring (2)
2816377 Head spring (3)

Spare parts for ML pliers, from ML tool bag.

ML tool maintenance

2816376 Head spring (1)
2816375 Lock spring (2)